



JPRS Report

Science & Technology

***USSR: Science &
Technology Policy***

4 AUGUST 1987

Soviet books and journal articles displaying a copyright notice are reproduced and sold by NTIS with permission of the copyright agency of the Soviet Union. Permission for further reproduction must be obtained from copyright owner.

SCIENCE & TECHNOLOGY
USSR: SCIENCE & TECHNOLOGY POLICY

CONTENTS

ORGANIZATION, PLANNING, COORDINATION

Units of System of Management of S&T Progress (V. Trapeznikov; PRAVDA, 8 Jan 87).....	1
Planning, Management, Measurement of Progress (G. Lakhtin; PRAVDA, 15 Nov 86).....	5

BUDGET, FINANCE

Fund of Development of Production, Science, Technology (EKONOMICHESKAYA GAZETA, No 52, Dec 86).....	9
--	---

FACILITIES, MANPOWER

Mikrokhirurgiya Glaza Interbranch Complex (NTR: PROBLEMY I RESHENIYA, No 24, 16-31 Dec 86).....	14
Educational Scientific Center of VUZ, Academic Institute (V. I. Krutov, A. Kichatov; MOSKOVSKAYA PRAVDA, 28 Nov 86).....	17
Efficiency of Operation of Intersectorial Works (G. V. Kushnarenko; IZVESTIYA AKADEMII LATVIYSKOY SSR, No 6, Jun 86).....	20

PATENTS, INVENTIONS

Rewards for Inventors, Introduction of Inventions (N. Lynnuk; NTR: PROBLEMY I RESHENIYA, No 24, 16-31 Dec 86).....	35
Rejected, Unused Inventions as Sources of Ideas (IZVESTIYA, 8 Dec 86).....	41

INDUSTRIAL, COMMERCIAL APPLICATIONS

Method of Cleaning, Protection of Pipelines (O. Lebedeva; NTR: PROBLEMY I RESHENIYA, No 24, 16-31 Dec 86).....	46
Introduction of Laser Doppler Meter Delayed (Yu. Nesterikhin, A. Illarionov; IZVESTIYA, 1 Nov 86)....	49
Briefs Reconditioning of Turbine Rotors	52

REGIONAL ISSUES

Plans of Development of Armenian Science Not Fulfilled (A. Agababov; KOMMUNIST, 3 Dec 86).....	53
Moldavian Interbranch Center for Introduction of Inventions (E. Kondratov; IZVESTIYA, 10 Jan 87).....	58
Marchuk on Development of Far Eastern Science (Guriy Ivanovich Marchuk Interview; SOVETSKAYA KULTURA, 4 Dec 86).....	61

CONFERENCES, EXPOSITIONS

Role of Workers' Creativity in Production Intensification (Yu. Meshkov; NTR: PROBLEMY I RESHENIYA, No 24, 16-31 Dec 86).....	64
Academy Presidium, Coordinating Council Meet in Vladivostok (PRAVDA, 18 Dec 86; EKONOMICHESKAYA GAZETA, No 50, Dec 86).....	66
Far East Development Trends, by N. Bratchikov	66
Use of Ocean, by V. Bratchikova	70
Development, Introduction of New Generations of Equipment (A. Yezhova; NTR: PROBLEMY I RESHENIYA, No 23, 2-15 Dec 86).....	72

Kiev Conference on Introduction of S&T Achievements (I. Sotulenko; EKONOMIKA SOVETSKOY UKRAINY, No 10, Oct 86).....	74
---	----

AWARDS, PRIZES

Vanag Prize of Latvian Academy Awarded to E. Ya. Lukevits (G. Zelchan; IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR, No 6, Jun 86).....	80
---	----

GENERAL

Problems of Scientific, Technical Progress in Construction (STROITELNAYA GAZETA, 19 Dec 86).....	82
---	----

/12223

ORGANIZATION, PLANNING AND COORDINATION

UNITS OF SYSTEM OF MANAGEMENT OF S&T PROGRESS

Moscow PRAVDA in Russian 8 Jan 87 p 2

[Article by Academician V. Trapeznikov under the rubric "About the Country of Soviets": "The Fairy Tale About Gnomes. What Is Hindering the Acceleration of Scientific and Technical Progress"]

[Text] As is known, basic and applied science and its close contact with production are the sources of scientific and technical progress. Now, during the period of reorganization, it is especially important to look back at the established system of the management of scientific and technical progress and at the individual units of this system.

The party is devoting much attention to the development of science, the state is allocating significant assets. Numerous programs, which encompass thousands of organizations and enterprises, are being formulated for the quickest implementation of scientific achievements. Difficulties, many of which lie in the overall disorder of the system of the formulation of programs of scientific and technical progress and the vagueness of the interconnections of its individual units, arise during their implementation. For example, branches of programs, which run independent from each other through the USSR State Planning Committee, the State Committee for Science and Technology, the USSR Academy of Sciences, and ministries, were developed in accordance with one of the decrees of the USSR Council of Ministers.

Such a system gave rise to numerous orders, commissions, and assignments. Since the channels, by which they came, in practice are not interconnected, the overall possibilities of the performer could not be taken into account in each of them. As a result, for example, in one case about 20 scientific themes "fell" from several directions upon a small group of staff members who worked in the corresponding direction. And this is only with respect to one decree. In the complex labyrinth of programs it is impossible to find a person who is responsible for one point or another of a program, which has often not been formulated skillfully enough.

In each major direction the performing organization usually has several, at times more than 10, "managers" in the person of superior organizations, which often without consent and without the consideration of their possibilities include institutes or design bureaus in scientific or technical programs,

appoint them as the main ones, give instructions, request information and reports on the most different forms, and force them to participate in endless meetings, taking up an enormous amount of time for unproductive labor.

The main organizations play an important role in the acceleration of scientific and technical progress. Scientific methods supervision and the overall coordination of the plans of coperformers on new equipment are included in their functions. It goes without saying that the main organization is the most qualified one in the given area and, therefore, should bear full responsibility for the scientific and technical level and quality of products not only within itself, but also at the organizations, associations, and enterprises, which are coordinated by it, that is, at the coperformers for the given theme and, more broadly, in the area which is coordinated by it. And instead of increasing responsibility this leads to complete irresponsibility. Indeed, the enterprise is responsible for the level and quality of products. If the main organization were also responsible for this, both parties would acquire a "legal" pretext for mutual incriminations.

Now the duties of the main organization are numerous, their list takes up three printed pages. It includes not only scientific and technical questions, but also others which are connected with the activity of the enterprises being coordinated. Of course, in this part of the list useful duties are also indicated, but the possibilities of the main organizations are not unlimited and the fulfillment of useful, but secondary duties diverts them from the basic tasks which directly influence the acceleration of scientific and technical progress. Duties, which are not characteristic of the main organization, turn it into an appendage of the ministry, transferring to it a portion of the functions of the staff of the ministry. The enormous amount of additional duties makes it incumbent to establish "offices" and an additional accounting and financial staff, which given an unchanged size will lead to its degradation in the area of science and technology.

But, of course, the main danger is that the main organization, in case of the conscientious fulfillment of the new coordinating functions, which have been assigned to it, will steadily turn from a scientific into a bureaucratic staff organization, documents will multiply, and less and less time will be left to think.

Our Institute of Control Problems of the USSR Academy of Sciences is also experiencing the influence of these trends. The institute has a highly skilled collective and is elaborating basic and applied problems of control, its original solutions have been introduced in various areas of the national economy--machine building and instrument making, metallurgy, power engineering, petrochemistry, petroleum recovery, and others. The high skill of the collective is enabling it to take upon itself the accomplishment of difficult tasks. The institute has trained highly skilled scientists, many of whom have become directors of republic institutes, has published hundreds of monographs and thousands of scientific articles, and has acquired national and international fame.

Apparently, as a result of this fame and on the basis of the strange assumption that its possibilities are unlimited, the institute is being included in a large number of programs. Often without consulting with it they give it diverse assignments, which in scope are equal to independent scientific themes, and in profusion appoint it the main organization or basic performer. As a result the institute turned out to be responsible for more than 120 major assignments which involved an enormous number of organizations. And the assignments continue to arrive.

A fairy tale automatically comes to mind: a client came to a tailor with his own material. Is it possible to make a suit from it? It is. What about two? It is possible. They agreed to 12 suits, which the client also received, but they were doll size. In that case 12 gnomes, whom the suits turned out to fit, were found, and everything turned out all right. But what about here? Is it useful for the institute to fulfill several of its numerous duties, say, by 10-20 percent?

As far as I know, a number of other "main" ones are in a similar position. Incidentally, it is useful for many planning organizations in various areas of the national economy to remember the fairy tale about the gnomes.

The structure of the management of technical progress, with a large number of independent "entrance commanders" and the narrow "neck" of the main organizations, which perform functions that are not characteristic of them, but influence numerous performers in the absence of the efficient regulation of interrelations, cannot operate satisfactorily.

It seems that the system of the management of scientific and technical progress requires an in-depth and thoughtful analysis. It is necessary to reduce the number of organizations which simultaneously influence each performer, having clearly specified their functions and the system of the formulation of programs. Obviously, this should be done in the process of the overall reorganization of the management of the national economy, which is now under way.

The interrelations of the numerous performing organizations--design bureaus, associations, plants--with the "main" organizations are not clear. For example, can a "main" organization order a plant to assimilate one product or another or to remove from production an old product under the conditions of the independence and self-financing of enterprises?

It is important to specify the functions of the main organizations, which are the points of control in the area of scientific and technical progress. These organizations should be well equipped, should have an experimental production base, should develop basic and applied science, on this basis should produce new, original scientific and technical ideas, and should move them forward into the national economy, by working in close contact with production and jointly bringing the ideas up to the stage of assimilation. It should be remembered: experience has shown that in practice it is impossible to introduce anything by forcible, administrative techniques. Provided that one producer or another evaluates a new development as promising and economically advantageous for it as compared with the known ones, he will accept it for

assimilation. The developer, in this case the main organization, needs to be able to demonstrate the advantage of his idea by a competitive comparison.

The main organization should carry out coordination first of all on the scientific methods level and participate in the evaluation of the level of the product in the area coordinated by it. Planning organs are obliged to discuss with it its possibilities to be a main organization in one direction or another, moreover, it is necessary to limit the number of tasks, otherwise we will inevitably arrive at the fairy tale about the gnomes.

The question of the management of scientific and technical progress is far from simple. Several suggestions, which were submitted by our institute, are being discussed. But the client and the enterprises that produce the product and their interest in increasing its quality all the same remain the main unit which advances the entire cause of acceleration. If this interest appears, they will actively begin to use the available scientific reserve and will begin to demand new solutions from scientists, and, hence, there will be acceleration in science and technology and their own competitive developments will exist. The main thing lies in this.

7807

CSO: 1814/112

PLANNING, MANAGEMENT, MEASUREMENT OF PROGRESS

Moscow PRAVDA in Russian 15 Nov 86 p 2

[Article by Doctor of Economic Sciences G. Lakhtin under the rubric "Complexes of Progress": "Means of Intensification"; first paragraph is PRAVDA introduction]

[Text] From the group of problems of economic and social development the task of accelerating scientific and technical progress is standing out more and more for its urgency and importance. The steps, which have been taken so far, have not led to a decisive change. Obviously, a fundamental change of the very approach to the problem is needed. If science has to change over more resolutely from the improvement of existing equipment to fundamentally new technical solutions, which revolutionize production, the same kind of revolutionary change is also required in the management of science.

It seems that the prototype of the future system of the management of scientific and technical progress is visible from the decree of the Politburo of the CPSU Central Committee, in which the task of developing passenger cars, which conform to the long-range level of the world automotive industry, is set for AvtoVAZ. This means that not a process and not technical innovations, which are to be introduced, but the final result is given. And the diametrical opposition to the prevailing method of planning scientific and technical progress consists namely in this.

The main thing is that the level, which is formed from the technical characteristics of the future vehicle, is given. A gauge of progress is thereby introduced. The measurement of scientific and technical development is the key to its management, since it is impossible to manage what is immeasurable. Precisely the lack of a gauge so far has had the result that not the final result, but the process of improving production is specified. The economic impact, for which there were many hopes, is not suitable as such a gauge. For if, for example, bad equipment replaced completely bad equipment, the impact can also be significant.

In this case the world technical level, moreover, not today's level, which will soon be surpassed, but the long-range level, should be the reference point. In other words, it is necessary to develop vehicles with indicators that are the best at the moment of future series production. The new approach

implies the comparison of the product with an objective standard which exists independent from us. It requires one to know "the degree of imperfection," but will also make it possible to manage technical growth accordingly.

The Basic Directions of USSR Economic and Social Development for 1986-1990 and the Period to 2000 can serve as the best evidence that the orientation toward the level gauge of scientific and technical progress has become urgent. The need to see to "the cardinal increase of the technical level of production" and the attainment of the level of the best world achievements is noted in the section which is devoted to the acceleration of scientific and technical progress.

The monitoring of the technical level of sectors has been assigned to the USSR State Committee for Science and Technology. But acknowledged rules of the determination of the technical level of products and the technical and economic level of production so far have not been developed, although this task is practicable. Apparently, the committee should also be in charge of formulating them and putting them into effect. Then instead of general appeals for the increase of quality and efficiency specific guidelines will appear for each case.

And, finally, a new form of the planning of scientific and technical progress--the state order, which is addressed to production, which is faced with technical renovation--was found in the example of AvtoVAZ. Having received such an order, the enterprise itself should determine what changes it is necessary to make and what it is necessary to develop for this.

Such a method of planning affords the opportunity to unite the plans of production and scientific and technical development. A unified plan, the unified management of its fulfillment, and unified responsibility will force the production worker to be equally concerned both about the current output of products and about technical progress. For the present the plan is in first place for the production worker.

Thus, the emerging outlines of the system of management of scientific and technical progress in the sectors of the national economy are: the levels of progress, which are measurable by the technical or the technical and economic level, are specified in a planned manner. State assignments on technical development are formulated. On the basis of the assignments the enterprises formulate programs of their fulfillment and supervise the implementation of these programs.

The changeover to such a system completely blends with the overall reorganization of the mechanism of management and should be regarded as a component of it.

Sectorial science will become a partner of production in all technical transformations. Reorganization inevitably affects it as well. In the past year new means have appeared in the organizational development of science. Decisions have been made on the transfer of a significant portion of sectorial institutes to scientific production associations and on the establishment of interbranch scientific technical complexes. The essence of these steps is

connected with the changeover from the extensive to the intensive direction of scientific and technical progress.

The extensive direction (that is, the gradual improvement of existing equipment and technology) assumed in sectorial science the form of "the scientific accompaniment of production." Every operation on production lines and every assembly in the design of an item is a potential object of improvement, therefore, the corresponding subdivision is established in the structure of the sectorial institute or design bureau. Such a structure was at one time a considerable achievement, it maintained the technical level of production at the time of its development in breadth.

Now the situation is changing. The state assignment on the increase of the technical level will require a shift from "scientific accompaniment" to a goal-oriented program of joint actions of science and production, for which their organizational convergence is desirable. Here the transfer of sectorial institutes to scientific production associations should also take effect. In such a union the role of a scientific and technical center, which ensures progress toward the set goal, is in store for the institute. This is not a main institute, to which production units have been turned over for the purpose of breaking in its developments for subsequent transfer to enterprises of the sector. But this is also not a plant laboratory, which is needed for eliminating immediate difficulties at the enterprise.

However, the transfer of institutes to scientific production associations can also lead to negative consequences, if it is not accompanied by a clear statement of the goal—for the sake of what this is being done, that is, what technical level production, which is being united with scientific and technical units, should attain. Otherwise the institute, which is now being accused of having become an appendage of the ministry, will become an appendage of the enterprise, which is doomed to work on minor themes.

The intensive direction of scientific and technical progress disclaims existing equipment, this is the means of revolutionary changes and shifts to equipment of new generations. The tasks connected with the development of integrated new technologies are appearing in the forefront. The intensive direction also needs organizations of a different type, which are intended for fundamental breakthroughs into new areas. This means was initiated by engineering centers and interbranch scientific technical complexes--problem-oriented organizations. They should not "accompany" operating production. Their tasks are different, and they, as a rule, require the uniting of the efforts of a large number of participants who belong to different departments.

For a long time the hopes in solving such problems were placed in comprehensive goal programs. However, serious drawbacks of the mechanism of goal program planning appeared—mainly the difficulty of subordinating all the participants in the implementation of a program to one manager without the destruction in so doing of the basic organizational relations. In interbranch scientific technical complexes such subordination, ideally, should be achieved. But complexes risk being turned into organizations which study a conglomerate of disconnected themes, if a unifying principal--the very goal orientation which is characteristic of programs--is not made the basis of

their formation. Apparently, one should think about the synthesis of two organizational ideas--goal program planning and interbranch complexes.

For the present interbranch complexes are being established under sectorial supervision--within industrial ministries. It is hardly possible to recognize such an organizational structure as the best. Let us recall what hopes were placed in the "belt of introduction" around the Novosibirsk academy campus. The institutes included in this belt were called upon to transform the achievements of academic science into developments for the corresponding sectors. However, administrative subordination to ministries turned them into ordinary sectorial institutes.

The introduction of the gauge of scientific and technical progress will pull behind it a chain of transformations in all the units of management of science and the implementation of its results. An opportunity is afforded to approach in a new way the evaluation of the activity of sectorial scientific institutions. Until recently it was believed that production workers alone, who shun innovations like the devil shuns incense, are to blame for the difficulties of technical development, while science is doing its job.

Apparently, the situation will change, if the activity of the sectorial institute is evaluated in terms of its contribution to the increase of the technical and economic level of the served works.

The greater a change is, the more significant the difficulties connected with its accomplishment are. In this case the changeover cannot be painless and smooth, both subjective and objective difficulties will be encountered.

7807

CSO: 1814/112

BUDGET AND FINANCE

FUND OF DEVELOPMENT OF PRODUCTION, SCIENCE, TECHNOLOGY

Moscow EKONOMICHESKAYA GAZETA in Russian No 52, Dec 86 p 14

[Model Statute on the Formation and Use of the Centralized Fund of the Development of Production, Science, and Technology and Reserves of Ministries, the Enterprises and Associations of Which Have Been Converted to Full Cost Accounting, approved by the USSR Ministry of Finance]

[Text] This Model Statute stipulates the procedure of the formation and use of the centralized fund of the development of production, science, and technology and of the reserves of ministries, the associations and enterprises of which work under the conditions of full cost accounting.

1. The centralized fund of the development of production, science, and technology is formed by means of deductions for the ministry from the profit of the associations and enterprises, which have been converted to full cost accounting, as well as the portion of the amortization deductions for the complete replacement of fixed capital, which is left after allocation for the fund of the development of production, science, and technology of associations and enterprises in accordance with the established stable norms.

2. The assets of the centralized fund of the development of production, science, and technology are allocated for the following purposes:

--the financing of research and development and other expenditures of a sectorwide nature;

--the financing of capital investments of a sectorwide nature for the retooling, renovation, and expansion of associations and enterprises and for the development of technically backward enterprises in case they lack their own assets;

--the financing of losses and the formation of the fund of the development of production, science, and technology of associations and enterprises, which are planned to operate at a loss and have a low profitability;

--the payments to the budget of the fee, which is collected from the client with respect to new construction in case of the upsetting of the deadlines of the placement of capacities and facilities into operation, which are

established by the plan, and other economic sanctions, which are attributable to the ministry in conformity with prevailing legislation, as well as the transfer of assets to the contracting organization in case of the early placement of new production capacities and facilities into operation;

--the repayment of loans of the USSR State Bank and long-term credits of the USSR All-Union Bank for Financing Capital Investments, which were granted directly to the ministry, as well as the payment of interest on them;

--the fulfillment of obligations to banks, which follow from the guarantees given by the ministry with respect to subordinate associations and enterprises;

--the covering of the expenditures on the organization and holding of the permanent and scientific exhibitions at the Exhibition of USSR National Economic Achievements;

--the pay of the management staff of the ministry;

--the increase of the skills of management personnel and specialists;

--the financing of the expenditures of higher, secondary, vocational and technical, and other educational institutions;

--the provision of temporary financial assistance to associations, enterprises, and economic organizations, and for other purposes.

3. The reserves of the ministry for the material incentive fund and the fund for sociocultural measures and housing construction are formed by means of deductions for the ministry from the profit of the associations and enterprises, which have been converted to full cost accounting, and cannot exceed 15 percent of the planned amount of these funds for the ministry as a whole. Moreover, the deductions of scientific and technical organizations, which are centralized for the payment of bonuses for the development, assimilation, and introduction of new equipment, are channeled into the reserve for the material incentive fund.

4. It is recommended to allocate the assets of the reserves for the material incentive fund and the fund for sociocultural measures and housing construction in conformity with the estimates for the following purposes:

--the increase of the incentive funds of associations (enterprises), which ensure the growth of the output of new highly efficient equipment and new consumer goods and of the indicator of the depth of refining of petroleum raw materials and the sharp increase of other indicators of production efficiency;

--the replenishment of the incentive funds of associations, enterprises, and organizations in instances, when the indicators of their work worsen temporarily in connection with the assimilation of new equipment, the renovation of production, or the capital repair of basic production facilities;

—the increase of the material incentive fund for the complete fulfillment of the volume of product sales with allowance made for contractual obligations on deliveries of enterprises which are planned to operate at a loss. Here first of all the amount of the saving, which was obtained by these enterprises from the decrease of the planned losses, is allocated for the indicated purposes;

—the creation of incentive funds for enterprises, facilities, and capacities, which are being newly put into operation (in accordance with the list approved by the ministry);

—the formation of incentive funds of associations and enterprises, which are planned to operate at a loss and have a low profitability;

—the payment of bonuses for aiding invention and efficiency promotion;

--the payment of bonuses for work on new equipment of a sectorwide and intersectorial nature, including the payment of one-time bonuses for the development, assimilation, and mass production of especially important and highly efficient types of equipment and machines, as well as the development and assimilation of fundamentally new technological processes;

--the payment of bonuses to the workers of the staff of the ministry in accordance with the procedure established for the workers of the centralized staff of ministries which are working under the new conditions;

--the giving of one-time incentives to workers for the fulfillment of especially important jobs and assignments, as well as the providing of material assistance to them;

--the construction, expansion, and capital repair of apartment houses and other nonproduction facilities;

—proportionate participation in the joint construction of apartment houses for workers of the management staff of the ministry;

--the purchase of passes for sanatoriums, holiday homes, holiday hotels, tourist centers, excursions and trips, and the conducting of cultural educational and physical cultural measures of the workers of the management staff of the ministry;

--other expenditures, which are connected with the social development and material stimulation of the labor collectives of the sector.

The specific directions of the use of the assets of the reserves for incentive funds are specified by the ministry jointly with the central committee of the trade union.

5. The assets of the centralized fund of the development of production, science, and technology and the reserves of the ministry in the amounts, which correspond to the limits of the subsidy, which are established by the ministry with their progressive reduction by years of the five-year plan, are the sources of the covering of the losses and the formation of the economic

stimulation funds of associations and enterprises, which are planned to operate at a loss and have a low profitability.

6. The standard of the deductions from the profit of subordinate associations and enterprises for the ministry as a whole for the formation of the centralized fund of the development of production, science, and technology and the reserves of incentive funds is defined as the ratio of the amount of expenditures for the purposes, which are stipulated in Paragraphs 2 and 4 of this Statute, on the basis of the assignments and calculations of the five-year plan, to the sum of the profit, which is left after the payment to the budget of the fee for productive capital.

The magnitude of the standard for the ministry as a whole is specified by the ministry independently and is stable for all the years of the five-year plan.

7. Ministries can differentiate the indicated standard by individual associations and enterprises. When approving the standards for associations and enterprises the correspondence between the amounts of the deductions with respect to the indicated associations and enterprises and the sum of the centralized fund and reserves for the ministry as a whole should be ensured. The indicated standards are stable with respect to the years of the five-year plan.

8. The absolute amounts of the centralized fund of the development of production, science, and technology and the reserves of the ministry when drafting the annual financial plans are specified on the basis of the standard which has been calculated in accordance with the procedure set forth in Paragraph 6 of this Statute.

9. The deductions for the ministry are made in accordance with a uniform standard which takes into account the amounts which are to be channeled into both the centralized fund and the reserve of the incentive funds.

In this connection no confiscation and intrasectorial redistribution of the profit, which is not envisaged by the legislation and does not follow from the interrelations between associations (enterprises) and the ministry, which are established by this Statute, are permitted.

10. The channeling of the assets, which have been received in accordance with the standards of the deductions from the profit of associations and enterprises, into the centralized fund of the development of production, science, and technology and the reserves of the incentive funds is carried out by the ministry on the basis of the estimate of the expenditure of the indicated fund and reserves. The balances of the assets of this fund and these reserves are used by the ministry during the next year in accordance with the procedure established by this Statute in conformity with the estimates of their expenditure.

11. The associations and enterprises, in the financial plans of which deductions for the centralized fund of the development of production, science, and technology and the reserves of the ministry are envisaged, make the

payments of these deductions to the ministry on the dates, which have been coordinated with the institutions of the banks.

The actual sum of payments to the ministry for the year and the corresponding period since the start of the year (the quarter, half a year, 9 months) is determined on the basis of the actually derived profit, as well as the established standard of deductions.

12. The assets of the centralized fund of the development of production, science, and technology and the reserves of the incentive funds are deposited in the current account of the ministry at the USSR State Bank.

13. If necessary the ministry in consultation with the USSR Ministry of Finance specifies the peculiarities of the application of this Model Statute as applied to the specific nature of work of the sector.

7807

CSO: 1814/110

FACILITIES AND MANPOWER

MIKROKHIRURGIYA GLAZA INTERBRANCH COMPLEX

Moscow NTR: PROBLEM. I RESHENIYA in Russian No 24, 16-31 Dec 86 pp 1, 8

[Article: "A New Rubric"]

[Text] The Mikrokhirurgiya glaza Interbranch Scientific Technical Complex was formed in May 1986.

The Moscow Scientific Research Institute of Eye Microsurgery of the RSFSR Ministry of Health, a pilot plant, an independent foreign trade association, as well as 12 treatment affiliates of the institute in Volgograd, Irkutsk, Kaluga, Krasnodar, Moscow, Leningrad, Novosibirsk, Orenburg, Sverdlovsk, Tambov, Khabarovsk, and Cheboksary are a part of the complex.

The task is the organization of the treatment of the most massive disorders of vision: cataracts and glaucoma, near-sightedness and astigmatism, far-sightedness and progressive near-sightedness in adolescents.

Corresponding Member of the USSR Academy of Medical Sciences Svyatoslav Nikolayevich Fedorov (in the top photo [photo not reproduced]) became the general director of the Mikrokhirurgiya glaza Interbranch Scientific Technical Complex.

In the children's department of the clinic of the Institute of Eye Microsurgery.

The continuation of the photo essay of our special correspondent A. Tyagna-Ryadno is on page 8.

One of the director's concerns of surgeon Fedorov is construction. The Finnish Polar firm is carrying it out jointly with Soviet specialists. In accordance with the contract, which was concluded with the firm, all 12 treatment affiliates will be built in 3 years. While the first four of them (particularly in Moscow, right under the windows of the institute, as well as in Cheboksary, Krasnodar, and Leningrad) should be completed already by the end of 1987.

A panorama of the construction site of the new building of the pilot works and the Moscow affiliate.

The pilot works today is 27 descriptions of products which are produced in small series.

Among them are steel microsurgical blades. About 120,000 of them are delivered annually not only to the subdivisions of the interbranch scientific technical complex, but also to all clinics of the Soviet Union. The production of diamond microtomes in accordance with the latest thermal chemical technology has been organized here (see NTR, No 19). Atraumatic suture material, surgical instruments and accessories, equipment for operating rooms--all this is being produced by highly skilled specialists in several sections of the pilot works.

Moreover, an enormous number of orders are being filled in accordance with the one-time requisitions of physicians and scientists of the institute.

Particular attention is being devoted to the production of artificial lenses--an entire shop is busy with them. In all about 20 types have been developed and produced in various collectives. Of them 13 are now being produced in series in the quantity of 25,000 a year. While in the very near future it is planned to increase the output to 60,000 a year.

In the photo [photo not reproduced]: inspector Ye.P. Utkina makes a final check of artificial lenses.

Courses in the training of physicians in advanced methods of surgical treatment have been in operation since 1980 at the institute. In this time a large number of specialists in such sections of ophthalmology as "eye microsurgery," "artificial lens implantation," and "the surgical correction of near-sightedness and astigmatism" have been trained. Now the courses are being changed over completely to the training of physicians for the newly established affiliates, for each of which it is necessary to train 20-25 highly skilled specialists.

In the top photo [photo not reproduced]: lessons are under way in the educational classroom of the courses. The classroom is equipped with a video monitor, cameras of which are installed in nearly all the operating rooms. Moreover, here there is an extensive video file, in which practically all the latest methods of operations, which are performed at the institute, have been gathered.

Diagnostics holds a most important place in treatment. Patients are carefully examined using the most advanced equipment. A computer center, among the functions of which is the calculation of forecasts of operations, operates at the institute. Similar computer centers will be established at each affiliate, while in the future it is planned to unite them into a unified computer network with a common data bank on ophthalmology.

In the photo [photo not reproduced]: physician I.V. Polukhanova and junior scientific associate O.G. Aleksandrova process on a computer the data on the form and optical strength of the cornea, which were obtained on a keratoanalyzer.

An automated operating unit, a diagnostic complex with a computer, and a holiday hotel for 300 people will be included in each treatment affiliate. The work of the affiliate will be based on the domestically produced operating conveyor line. The development of such a conveyor line is now being completed at the Cheboksary Standard-Unit Plant. The operating conveyor line, which was produced in accordance with the sketches of S.N. Fedorov by the Siemens firm, has been operating for 2 years at the institute. On the basis of this experience the Cheboksary engineers jointly with scientists of the Moscow Scientific Research Institute of Eye Microsurgery developed a new, more advanced design of the conveyor line--a line of the revolving type.

In the photos [photos not reproduced]:

The operating conveyor line.

Physician T.L. Gorlina at one of the stages of the operation.

"Glasses are no longer needed!"

Starting in 1989, when all 12 of the affiliates of the institute will go into operation, 200,000 similar cures will be carried out annually at the Mikrokhirurgiya glaza Interbranch Scientific Technical Complex.

7807

CSO: 1814/108

EDUCATIONAL SCIENTIFIC CENTER OF VUZ, ACADEMIC INSTITUTE

Moscow MOSKOVSKAYA PRAVDA in Russian 28 Nov 86 p 2

[Article by Professor V.I. Krutov, chairman of the Scientific and Technical Council of the USSR Ministry of Higher and Secondary Specialized Education, recorded by A. Kichatov, under the rubric "The Prospects of the Higher School": "The Law of the Composition of Forces"; first two paragraphs are MOSKOVSKAYA PRAVDA introduction]

[Text] To start with here is some information: an educational scientific center has been established and is operating successfully under the Institute of Solid State Physics of the USSR Academy of Sciences and the Moscow Institute of Steel and Alloys (MISI). What is this?

Here are the comments of Professor V.I. Krutov, chairman of the Scientific and Technical Council of the USSR Ministry of Higher and Secondary Specialized Education:

"This is an organizational form of educational and scientific work, which does not require additional financing and an increase of staff. At the center there is not one staff position at all, associates of the academic institute, instructors, graduate students, and undergraduates of the higher educational institution work here. Here people study at a special faculty of the higher educational institution for the retraining of personnel in new promising directions of science and technology. Engineers and scientists of plants, scientific research institutes, and design bureaus, who have a length of service of not less than 3 years, undergo here retraining in such specialties as the protection of metals against corrosion, ultrasonic and laser engineering and technology, and the automation of scientific research. It is possible to acquire here the necessary skill in just 6 months.

"The center is called upon to strengthen the contacts of VUZ scientists and students with workers of the Academy of Sciences. There is, for example, the following detail: at the Institute of Solid State Physics of the USSR Academy of Sciences upperclassmen of the Moscow Institute of Steel and Alloys not simply do practical training, but also study. And within the walls of the academic institute its staff members conduct lessons with them. The students are afforded the opportunity to work on single-design equipment and to take part in specific scientific developments. This applies both to staff members

of the higher educational institution and to graduate students who are conducting research at the meeting point of disciplines....

"What does such cooperation yield in practice? Let us use for illustration one example which shows quite vividly the prospects of the 'composition of forces' of the higher educational institution and the academic institute. It will be a matter of research which is aimed at the development of technologies and equipment for the synthesis of refractory inorganic compounds and metals with the use of ultrasonics.

"The development has a past history. Approximately 2 decades ago a group of scientists from a department of the Institute of Chemical Physics of the USSR Academy of Sciences (OIKhF AN SSSR) headed by A.G. Merzhanov discovered a new physical phenomenon: it is possible to fuse specially selected mixtures of powders, without supplying any thermal energy. The phenomenon received the name self-propagating high-temperature synthesis (SVS).

"The prospect of a new direction in powder metallurgy came to light. Studies of the very process of combustion were started. It was necessary to learn first to monitor the process, and then as far as possible to control it, to make it most effective, and to select such mixtures and such conditions of combustion that the final product would have the best properties. As a result of much work a sound theory of self-propagating high-temperature synthesis has already been developed, thus far more than 200 different refractory alloys have been synthesized by this method. The method has been successfully introduced in production and is undergoing further dissemination.

"It would seem that the problem had been settled, but.... The idea of testing ultrasound as a kind of catalyst of heat and mass exchange processes arose. The participation of experienced metal science specialists was required. The Moscow Institute of Steel and Alloys turned to the Institute of Solid State Physics of the USSR Academy of Sciences with a proposal on cooperation. There they were not hard to persuade. Another participant in the cooperation--the Institute of Chemical Physics of the USSR Academy of Sciences--took upon itself everything that concerns the physics of combustion. Thus a triple union of two academic institutes and a higher educational institution was formed. Work was begun under the general supervision of Professor A.G. Merzhanov.

"The first experiments showed that ultrasound affects the process of combustion. It was not clear to what degree and in what direction, but the fact itself was present. Hence, it is possible to hope for an improvement of the final product, for this it is necessary to learn to control the ultrasonic catalyst in the necessary manner.... In a comparatively short time the optimum technological conditions were found and a semicommercial unit was assembled.

"Production specialists took an earnest interest in the work. In the immediate future the technology proposed by scientists will begin its work biography. The use of the ultrasonic unit promises striking advantages: the density of an alloy increases, the hardness is increased by 10-15 percent.

"But this is also not everything. It was possible to obtain wear-resistant carbide facings by the method of self-propagating high-temperature synthesis with the use of ultrasonics. Thus, in a laboratory of a department of the Institute of Chemical Physics of the USSR Academy of Sciences, which is headed by I.P. Borovinskaya, they take, for example, the share of a worn-out plow, sprinkle its cutting part with powder of the reaction mixture, and ignite the powder. It burns up, forming a hard and durable facing. The difficulty of the procedure is for the built-up layer to be thin and durable, with high adhesion to the steel base. Ultrasound promotes the spreading of the material and reduces its grain.

"As you see, the cooperation of VUZ science with academic science is yielding fruits," V.I. Krutov sums up his comments. "Perhaps, each of the participants in cooperation could have arrived on their own at the same results. But at the price of inefficient expenditures of time, forces, and assets. Moreover, the educational scientific center brings together under one roof specialists of different scientific schools and directions. The exchange of information, debates, and joint discussions of the results of developments are also the 'product' being planned by the center. The sphere of activity of the higher educational institution is being expanded, sectorial institutes and industrial enterprises are being included in its orbit. This is one of the means of the integration of education, science, and production, which was outlined during the reorganization of the higher school."

7807

CSO: 1814/112

EFFICIENCY OF OPERATION OF INTERSECTORIAL WORKS

Riga IZVESTIYA AKADEMII LATVIYSKOY SSR in Russian No 6, Jun 86 (manuscript received 17 Jun 85) pp 27-38

[Article by G.V. Kushnarenko, the Institute of Economics of the Latvian SSR Academy of Sciences: "The Increase of the Efficiency of the Production of Items of Intersectorial Application"]

[Text] At the present stage of the development of the national economy the demands on the efficiency of social production on the basis of intensification and the acceleration of the introduction of the achievements of scientific and technical progress are increasing. In the Basic Directions of USSR Economic and Social Development for 1986-1990 and the Period to 2000 tasks of enormous political importance are posed: "...to raise productive forces and production relations to a qualitatively new level, to accelerate scientific and technical progress substantially, to ensure rapid progress in the strategic directions of the development of the economy, to create a production potential which is equal in its scale to the potential accumulated during all preceding years." (1) The accomplishment of the posed task is possible only in case of the radical improvement of economic organizational work in all the sectors of the national economy and the acceleration of the updating of the production system and the achievement of the balanced operation of the different units of social production.

In this article the problem of the increase of the efficiency of intersectorial production as one of the components of social production is examined. The determination of the basic methodological principles of increasing the efficiency of intersectorial works at the present stage of the development of the economy is the goal of the article. The organizational structure and the level of the technical supply of intersectorial works and their conformity to the requirements of scientific and technical progress are analyzed in the work. The offered recommendations on the improvement of the organization of the production of general machine building products are given, for the most part, within the framework of the prevailing methods of the planning and management of the national economy.

When studying the problem of increasing the efficiency of social production (including intersectorial production) at present it is necessary to take fully into account the peculiarities of the present stage of the functioning of the

economy, which, along with the growth of the scale of production and the increase of the level of its socialization, is also characterized by the intensification of contradictory trends in the national economy. On the one hand, specialization on the basis of the continuing division of labor is developing, concentration is increasing, and cooperative relations are broadening and, on the other, the process of the adaptation of economic units to the dynamic conditions of functioning is developing.

These trends reflect the contradiction between the aspiration for the increase of the efficiency of social production as a whole by the enlistment in the output of a specific product of a larger and larger number of narrowly specialized enterprises (moreover, in theory preference, as a rule, is given to technological and part specialization) and the need to strive for the increase of the stability of production processes and the reliability of economic relations, which is often achieved by the creation and increase of the reserves of raw materials, materials, and components, as well as through the organization at each individual enterprise of a general-purpose production structure. This makes it possible to a certain degree to reduce the dependence on several factors, which are external to the enterprise, and first of all on the interruption of deliveries of individual types of raw materials, materials, and equipment, at least with respect to the relations which do not directly influence the course of the basic technological process.

The indicated contradictions arose and intensified not only in connection with the increase of the scale of production and the slow changeover to intensive methods of management. This is the main, but not the only cause of the aggravation of the contradictions. An obvious discrepancy between the demands, which are being made on production at the present stage of scientific and technical progress, and the traditional views of the conditions of the increase of the efficiency of the functioning of the economy, particularly specialization, concentration, the development of cooperation, and accordingly the technical and economic policy, which conforms to these views, is being observed.

This discrepancy appeared especially visibly in the functioning of intersectorial works and adversely affected the efficiency of their development. The national economy at present is not being fully supplied with products of intersectorial works in both the quantitative and qualitative respects. Such a situation is explained first of all by the low organizational and technical level of these works. Intersectorial works (MOP) are engaged in the production of machine tool attachments, nonstandard equipment, packaging, and various kinds of fasteners and carry out the repair of equipment and the production of spare parts.

The organization of social production, which formed historically during the period of the postwar restoration of the economy of our country and is oriented toward the self-meeting to a significant degree of the needs of enterprises, guaranteed a sufficiently high degree of reliability of production processes under the conditions of comparatively poorly developed cooperative relations. The item specialization of production at relatively isolated enterprises, which were made up of several shops of different sectors in accordance with the principle of the self-sufficiency of the production

process, received predominant dissemination in industry. Such a nature of development had the result that at present the overwhelming majority of industrial enterprises, kolkhozes, sovkhozes, and other nonindustrial organizations independently repair their own equipment and produce spare parts, machine tool attachments, and several other types of items of intersectorial application.

A unique organizational structure of the intersectorial works formed. This works includes: specialized plants of the corresponding type; enterprises which produce general machine building products as component products for the basic items; machinery and repair shops of machine building enterprises and machinery and repair subdivisions of nonmachine building enterprises and organizations. Thus, at present four types of subdivisions, which are equipped for the production of products of intersectorial application, are actually in operation. (In the article a works, which produces one or several types of general machine building products, is understood as a subdivision of the intersectorial works.) The distinctive traits of each of the indicated types of subdivisions of the intersectorial works are, first, the functions performed by it, as well as the used equipment and technology. The level of the technical equipment of the subdivisions in question has a fundamental difference subject to the type.

Modern equipment and advanced technology are used at specialized enterprises and relatively large works, which belong to leading production and scientific production associations. As a rule, obsolete equipment and a simplified technology of producing items are used in the machinery and repair shops of nonmachine building enterprises and organizations. Such a broad variation of the organizational and technical conditions of production has the result that items of similar purpose and design, which are produced at different types of subdivisions of intersectorial works, differ substantially from each other both in quality and in the expenditures on production, while the national economy incurs losses from the inefficient use of resources. In all 45 percent of the metal working equipment and 5-6 percent of the workers are employed in the machinery and repair shops of nonmachine building enterprises, while the utilization of equipment and labor productivity are several fold less than in machine building.(2)

Several unresolved questions of the increase of the efficiency of the national economy as a whole: the poor development of "firm" repair; the low level of the unification and standardization of the machines and equipment being produced; the lack of the necessary economic stimuli for the specialized production of spare parts, and others, are adversely influencing the efficiency of the work of the subdivisions of intersectorial works. The organizational structure of intersectorial works, which has now formed, not only complicates the solution of the indicated problems, but, in turn, has led to the development of a large number of negative trends in the sectors of the national economy. The examination of the entire range of unresolved questions and the reciprocal influence of one on another and on the functioning of social production as a whole is not the goal of the article. However, the need is arising for the analysis of the development of the trends and problems, which are directly connected with the task of improving the work of

the intersectorial works and the solution of which to a significant extent depends on the increase of the efficiency of this works as a whole.

The quantitative increase of the stock of metal working equipment is one of the most conspicuous trends, which emerged and intensified in connection with the organization of the production of general machine building products. This increase is being accompanied by such negative phenomena as the extremely slow pace of the modernization of the stock and the small proportion of advanced types of equipment and of equipment, which is concentrated in basic production of machine building enterprises. Only 24 percent of the new metal working equipment in 1981 was used for the replacement of obsolete equipment.(3) The situation also did not improve subsequently. According to the estimate of D.M. Palterovich and S.A. Kheyman nearly 40 percent of the entire stock of metal working equipment of the national economy is at nonmachine building enterprises, while not more than 30-40 percent of all the metal-cutting machine tools and forging and pressing equipment is being used in basic production of machine building sectors. The stock of metal working equipment is increasing most rapidly in agriculture. In 1980 there were 750,000 units here, moreover, more than 400,000 of them were concentrated in the workshops of kolkhozes and sovkhoses and more than 200,000 were concentrated in the system of the State Committee for the Supply of Production Equipment for Agriculture.(4) The level of the intensive and extensive use of equipment is extremely low. The situation with the use of the stock of metal working equipment and its structure is also similar in our republic.

The function of intersectorial works of servicing all the sectors of the national economy and industry objectively placed the problem of increasing the efficiency of the operation of these works at the center of the contradictory trends of the development of the economy. The actually uncontrollable quantitative increase of the stock of metal working equipment, as well as several other special problems of practical economic activity (the low utilization ratio of metal, the shortage of machine tool operators in basic production of machine building, the inadequate level of the quality of the output being produced, and others) are arising to a significant extent due to the fact that so far the more general theoretical problems have not been solved and, first of all, the essence of the efficiency of the process of specialization during the present period has not been fully revealed and the basic methodological principles of the improvement of the functioning of intersectorial works and the criteria of the efficiency of their operation at different levels of management have not been determined. The problem of increasing the efficiency of the functioning of intersectorial works for more than 25 years now has remained urgent both in practice and in theoretical research. In spite of the quite lengthy period of study, an acceptable solution was not found. The situation in question formed in many respects due to the fact that the recommendations on increasing the efficiency of the output of products of intersectorial application did not have thorough scientific substantiation and were often of an empirical nature, the foreign experience that was available in this area was not interpreted creatively enough with allowance made for the formed conditions of the development of the domestic economy; an attempt was not made to interconnect the strategic goals of the development of the national economy and the cost accounting interests of enterprises and organizations--the specific performers of the proposed

recommendations. The indicated circumstances did not make it possible to formulate and implement a clearly expressed policy, which is implemented in a centralized manner, on the improvement of the organizational structure of intersectorial works and the improvement of their operation.

In the future it is necessary "to change production over to the primarily intensive type of development, to achieve the cardinal increase of the productivity of national labor, and on this basis to speed up the pace of economic growth." (5)

The changeover to the primarily intensive type of development requires a higher level of organization of social production, including in the production of general machine building products. Here the settlement of specific (in many respects applied) questions, which are being directly posed by practice, should be based on complete theoretical clarity in the most general fundamental provisions of the problem being studied.

Since the intersectorial works is only one of the elements of social production, the task of increasing the efficiency of its functioning should be examined not in itself, but necessarily in the system of processes and phenomena, which are occurring in the national economy as a whole. Given a different approach, that is, given the isolated study of the problem of increasing the efficiency of the production of products of intersectorial application the conclusion of the invariable content of the problem arises. Precisely such an approach complicates the understanding of the process of the socialization of production, the content of this process at the present stage is the cause of disconnected, insufficiently substantiated recommendations on the improvement of individual elements of the national economy, which are directly connected with the functioning of the intersectorial works. On this level the proposals of several scientists on the improvement of the structure of the stock of metal working equipment and the increase of the level of its use are a typical example. Thus, V.P. Goremykin regards as expedient the changeover to the centralized planning of not only the output of metal working equipment, but also the very structure of the stock in the sectors of the national economy, the pace of its updating and modernization, and capital resources. (6) A similar opinion is expressed by A.M. Ilyshev, who proposes to improve the use of equipment at enterprises and in shops of household machine building by the direct standardization and planning of the utilization of equipment and to formulate centralized standards of the proportion of nonoperating equipment (equipment which is undergoing planned preventive maintenance and reserve equipment) and the number of machine tool hours which are to be completed by a unit of operating equipment in a day, week, month, and year. (7) The indicated position, which is widespread, does not take into account the fact that the structure and level of the use of equipment depend most directly on the assortment of output being produced, which at present numbers millions of descriptions and is constantly being updated, on the series nature of production, on the organizational and technical level of enterprises, and on a large number of other factors. The centralized planning of the structure and level of use of equipment will not be capable of reacting promptly to the changing conditions of production and will only adversely affect the degree of economic independence of enterprises. However, the recommendations of these authors can be used in the elaboration of exacting

standards of the utilization of equipment subject to its technical level, service life, and the functions being performed, which would contribute to the concentration of metal working equipment in basic production of machine building and to the acceleration of its updating.

The lack of a systems approach in analyzing the efficiency of the work of various types of subdivisions of the intersectorial works influenced the determination and choice of specific means of improving the structure of the given works. Until very recently the concentration of the output of the entire volume of general machine building products at specialized enterprises was suggested in the literature as the most effective version. A quite large group of economic scholars support this point of view.(8) The differences between them are not of fundamental importance and, for the most part, concern the methods and forms of management of the production of products of intersectorial application due to the strengthening of the territorial aspect in management and the singling out of a special superministerial organ, which would contribute to the settlement of all intersectorial questions.(9)

On the other hand, numerous studies (including of the mentioned group of scientists) testify that at present the necessary conditions for the implementation of the proposed version are lacking:

—first, for the present a high level of the standardization and unification of items has not been achieved even on the sectorial scale—in machine building alone more than 200 enterprises produce for their own needs in a year 300 million pinions and about 100,000 type sizes, 15,000 type sizes of rolling bearings and 60,000 type sizes of gaskets, washers, and rings are produced;(10)

--second, the volume of output of general machine building products at specialized enterprises is extremely negligible—for the present specialized intersectorial works are meeting only 10 percent of the needs for various types of their products, while 90 percent of the items of intersectorial application are being produced by the user sectors;(11) the growth rate of the proportion of specialized subdivisions of intersectorial works is low—the centralized production of blanks, just as 10 years ago, comes to only 3 percent of the total volume of output, in particular, castings—4-5 percent, forge work and stampings—2-3 percent;(12)

—third, such a sector as the industry of products of general machine building application, if it is established, will be hard to manage and unwieldy, for the proportion of these products is very significant and amounts to 20 percent of the total production volume in machine building(13) (just to produce in a centralized manner only 60 percent of the assemblies and parts of lubricating systems, in machine building it is necessary to establish the largest sector made up of all the existing ones both in capacity and in the number of workers);(14)

--fourth, the proposed cardinal reorganization will lead to significant economic losses, since it is impossible to suspend or interrupt without losses the established system of relations, which is based on the features developed over the years of the designs of the assemblies and parts being produced.

The statistical data cited above show very convincingly the lack of objective conditions for the complete centralization of the output of items of intersectorial application. It is necessary to approach realistically the question of what the economy at this stage of development can and cannot give.

But in addition to the fact that the version of the complete centralization of the output of products of intersectorial application in practice is not feasible at present, the question of its efficiency with allowance made for the peculiarities of the present stage of scientific and technical progress remains open. It is quite obvious that numerous proposals on the increase of the centralization of intersectorial works are based on the concept which regards the centralization and intensification of specialization in this sphere of the economy as decisive factors of the increase of the degree of socialization of production and the increase of its efficiency. As a whole such a statement of the problem does not arouse objections. Indeed, the increase of the level of the socialization of production finds expression in the intensification of specialization, the increase of concentration, the broadening of cooperative relations, and the combination of production.

For a long period of time the process of the intensification of specialization, which finds expression in the concentration of the production of individual types of products or their parts in independent sectors of production and at individual independent enterprises, was the main factor of the increase of the degree of the socialization of production. The development of specialization is conducive to the increase of the volumes of output being produced and to the growth of labor productivity by the utilization of specialized equipment, the use of purposefully trained staffs of specialists, and the increase of the series nature of production. The listed advantages of the intensification of specialization are also being taken into account by the economists who propose the version of the complete specialization and centralization of the production of general machine building products. But in so doing the other factors of the process of the socialization of production are underestimated. The increase of the level of socialization is characterized not only by the development of specialization on the basis of the division of labor, but also by the uniting of disunited processes into one social process of production, and this aspect of the process of socialization is becoming more and more significant at the present stage of scientific and technical progress, which is leading to the change of the basic elements of production and the demands on its functioning and to the transformation of the conditions of economic development. The scientific and technical revolution is contributing both to the further intensification of the social division of labor and on this basis the development of its specialization and to the strengthening of the integration features in production.

In the present economy the continuous broadening of relations, which transform not only the basic technological process at the enterprise, but also the entire production infrastructure, is occurring, which is also conducive to the intensification of the integration of various works. The uniting of works of different types for the production of a complex product is occurring. This especially appears in the production of machines and equipment. This

phenomenon is a relatively new stage in the process of the further socialization of production. The trend toward the unification of nonstandardized works in one technological flow of the production of products is characteristic of not only domestic, but also foreign management practice. It is actually identical to the process of diversification, by which there are understood the broadening of the objects of activity and the range of products, which are produced by the enterprise or association, and the assimilation of items which technologically are inadequately linked.(15)

Capitalist firms use diversification, which is responsible for the multisectorial nature of production, for the decrease of the dependence on the state of market conditions in one sector and for the more successful withstanding of the instability of market demand. For socialist enterprises diversification creates favorable opportunities for the increase of production efficiency due to the improvement of the conditions of the use of all types of resources to advantage, the assurance of the rapid assimilation of a new product with the minimum expenditures, and the improvement of the use of raw materials, including byproducts and production waste.

Diversification to a significant extent is also due to the demands of advanced technologies and the complication and individualization of production, in particular, in machine building the proportion of products, which are custom-produced and produced in small series, is increasing. In this connection the position of the group of authors, who believe that the concept of the economic profitability of the maximum narrowing of the specialization of production, the ideal of which is the enterprise which produces one type size of product, at present does not justify itself, seems quite valid.(16) Such a structure of production, which creates the conditions for the complete utilization of raw materials and the recovery of waste products and increases the flexibility of enterprises in reacting to changing situations in management, as well as the capacity for the changeover of production for the output of a new product, ensures to a greater degree the rapid updating of products. The elaboration and development of a structure of production, which meets the indicated conditions, can be accomplished only by the joint efforts of both researchers and experienced workers.

One must not regard the intensification of the specialization of production and the development of diversification as kinds of antipodes, as mutually exclusive processes. As the experience of practical management activity testifies, these processes are in fact two aspects of the socialization of production and form its structure. K. Marx indicated that "the resolution of theoretical opposites itself proves to be possible only by practical means, only by means of the practical energy of people, and that for this reason their resolution is by no means a task only of cognition and is actually a vital task."(17)

Indeed, in various sectors of industry work is being performed (true, in many respects spontaneously, without proper organization and purposefulness) on the improvement of the structure of production in conformity with the tasks of the acceleration of scientific and technical progress. The organization of the interaction of large enterprises with more maneuverable and flexible small and medium enterprises is one of the basic directions of the work. Such

interaction is most effective within modern production associations, within the framework of which the necessary conditions are created for the intensification of the specialization of the structural subdivisions. As the experience of the work of the leading machine building associations of the country (the Kamskiy avtomobilnyy zavod and Volzhskiy avtozavod associations) and in the Latvian SSR (the VEF, REZ, and Radiotekhnika associations) shows, the making of a sufficiently broad assortment of products of intersectorial application at relatively small works, which are furnished with advanced equipment and have been included within these associations, can be accomplished no less effectively than at the specialized subdivisions of intersectorial works. Therefore, the traditional argument about the essence of the subdivisions of intersectorial works, which are a part of large enterprises and associations, as elements of a "natural" economy seems insufficiently legitimate. Enterprises and associations in case of such an approach are mainly regarded only as representatives of the corresponding ministries (departments). The functions of the enterprises on the meeting of specific needs of the national economy with allowance made for the necessity of the optimum use of the resources being allocated to them are not taken into account. In such a role enterprises and associations (especially the leading ones in their sectors) appear as spokesmen of national economic, and not narrow departmental interests, and the establishment within them of subdivisions, which have been equipped for the output of general machine building products, should be regarded as a compromise version of the formation of a modern production structure. This structure makes it possible to a significant degree to ensure the meeting of the vital needs of the national economy with allowance made for the present demands on the development of the economy, as well as the prevailing methods of planning and management and the real conditions of the functioning of the national economy.

The indicated assumption is confirmed by research, including the research conducted by staff members of the Sector of Comprehensive Planning of the Institute of Economics of the Latvian SSR Academy of Sciences on the comparative evaluation of the economic efficiency of the work of the Daugavpils Latvremstanok Plant and individual machine building plants and machinery and repair shops of enterprises and organizations of the republic. Thus, peculiarities, which are due to the effect of scientific and technical progress and confirm the interdependence and interconditionality of the specialization and diversification of production, are arising at the present stage in the functioning of intersectorial works.

The formed organizational structure of intersectorial works gives the process of the socialization of production in the sphere of the economy in question a very unique character and not always clearly oriented and not entirely customary forms. In the functioning of the intersectorial works as a whole it is possible to see both elements of the new intensive period of the development of the national economy and extensive factors, which continue to operate and even have distinct development. For the formulation and implementation of a goal-oriented technical policy on the increase of the efficiency of the performance of services and the production of items of intersectorial application it is necessary to determine which of the existing types of subdivisions of intersectorial works in fact are a vestige of the preceding stage and on a broadening scale reproduce the characteristic traits

of the extensive period of development of the economy and which types of subdivisions of this works, which emerged during the period of postwar restoration, were transformed under the influence of the factors of scientific and technical progress and contribute to the meeting of the needs of enterprises, which are due to the changeover to the intensive form of production.

As a rule, when analyzing the comparative efficiency of the work of various types of subdivisions of the intersectorial works the indicators of the adjusted expenditures or the cost of the production of a specific assortment of products or services are used. However, the comparison of just these indicators is insufficient for drawing a distinction between the subdivisions of the intersectorial works. The calculations of the cost of production in shops and at specialized enterprises are made by different methods (in machinery and repair shops only the shop expenditures are taken into account, at independent enterprises all the expenses for the plant are taken into account); the assortment of products being produced is so broad that often the expenditures on the production of analogous items may differ both in amount and in direction (the expenditures on the production, for example, of a screw are higher in one type of subdivision of the intersectorial works, while the expenditures on the production of a sleeve are higher in another). But the question consists not only in the improvement of the methods of calculation and the use of new indicators. The problem consists first of all in the essence of the functions of the intersectorial works. The different subdivisions of the intersectorial works are called upon to service the basic technological process as elements of the infrastructure. Therefore, the use of the indicators of the production cost and adjusted expenditures is insufficient for determining the efficiency of the work of one subdivision or another; the main thing is to establish the degree of satisfaction of the needs of basic production and the conformity to the requirements of the acceleration of scientific and technical progress.

One of the basic conditions of the systems approach to the functioning of any sufficiently complex organization is the subordination of the work of its elements to the efficiency of the organization as a whole and the regarding of efficiency as the degree of conformity of the results to the goals of the organization.(18) That is, a specific subsystem or element can operate less efficiently (if this work is examined in isolation of the activity of the system as a whole) as compared with the other versions, if this ensures the most efficient functioning of the entire system with allowance made for the existing conditions of development. This assumption also fully applies to the work of the subdivisions of the intersectorial works, if they are regarded as a subsystem which is called upon to meet the needs of basic production. For the enterprise or association the work of the subdivision of the intersectorial works, which is a part of them, can be (and in practice this is a quite ordinary phenomenon) more profitable, in spite of the fact that the production of the necessary items and the performance of the necessary services are carried out significantly more economically from the standpoint of the use of specific resources at the specialized subdivisions of the intersectorial works.

The analysis of the demands on the production infrastructure during the current period makes it possible to specify the basic methodological principles which are necessary for the differentiation of the types of subdivisions of the intersectorial works in conformity with their role in the functioning of the economy and for the increase of the efficiency of the output of products of intersectorial application:

—the purpose of the product produced by the given type of subdivision of the intersectorial works or the services performed by it—for the maintenance of tools of labor in working order or for the support of expanded reproduction on a new technical base;

--the decrease of expenditures on the output of general machine building products;

—the achievement of the necessary quality of the production of products;

--the guarantee of the timely support of users in conformity with the specified volume and quality of production.

The analysis of the work of the subdivisions of the intersectorial works in conformity with the above-indicated fundamental assumptions as a result will make it possible to establish to what extent the work of the given subdivision influences the increase of labor productivity both at the enterprise (association), of which it is a structural element, and in the national economy as a whole. In other words, the role of the subdivision in the acceleration of scientific and technical progress as the main condition in the efficiency of the functioning of any unit of the national economy during the present period will be established on the basis of such an analysis.

The observance of this main technological principle when examining the efficiency of the work of various types of subdivisions of the intersectorial works creates the basis not only for their differentiation, but also for the fundamental combination of the specialization and diversification of the production of products of intersectorial application at various levels of management and the formulation of a unified goal-oriented technical policy on the improvement of the organizational structure of the intersectorial works and the increase of the efficiency of its functioning.

The differentiation of the types of subdivisions of the intersectorial works in conformity with the above-indicated principles will make it possible to implement a differentiated approach to the development of each of them and to select priorities when improving the works which produce various types of general machine building products. One should, first, support the universalization of production when establishing the subdivisions of the intersectorial works as service subdivisions, if this ensures the speeding up of the output of the new product and the increase of the technical level of production. This assumption also applies to the work of the subdivisions of the intersectorial works which increase the flexibility of enterprises and associations in reacting to the changing conditions of management (the change of suppliers of materials and components, as well as users; the change of the demands on the technical and economic parameters of the product being

produced; emergency situations, and others). These functions for the most part are characteristic of the work of the corresponding works which are a part of large production associations.

The completely opposite situation is appearing in the work of numerous subdivisions of the intersectorial works, which are engaged in maintaining the servicability of machines and equipment within nonmachine building enterprises and organizations. These subdivisions perform the role of a compensator, moreover, an inefficient compensator of the inadequate support in a centralized manner of various types of products and services of the intersectorial works, by using equipment and material resources inefficiently and increasing the shortage of skilled machine tool operators in the machine building sectors of industry (the shift coefficient of metal-cutting machine tools at machinery and repair sections of enterprises, which are subordinate to the republic ministries of the construction materials industry and light industry, does not exceed 0.5-0.6, while in a number of cases it is even less; the utilization ratio of metal comes to 0.1-0.2, and so forth). The existence and establishment of subdivisions of this type fundamentally contradict the requirements of the intensification of the economy.

In practice it is advisable to carry out the implementation of the differentiated approach to the development of various types of subdivisions of the intersectorial works with the aid of the goal program method. It is necessary to formulate a program of the stage-by-stage specialization and increase of the efficiency of the production of products and performance of services of intersectorial application. Moreover, this program should include several hierarchical levels, taking into account both the needs of the national economy as a whole and the needs of regions, as well as the interests of individual sectors and enterprises. The existing programs of this sort in individual sectors and regions (including the comprehensive program "The Development of Intersectorial Works in the Latvian SSR") do not fully satisfy the above-indicated requirements, do not ensure the comprehensive solution of the problem, experience the influence of sectorial or local interests, and do not achieve the planned results. Thus, for example, the placement into operation of the Daugavpils Latvremstanok Plant did not solve the problem with the repair of general-purpose metal-cutting tools in the republic. According to estimates of the Institute of Economics of the Latvian SSR Academy of Sciences only 20 percent of the program of the plant is formed of orders of enterprises which are located on the territory of the republic.

In order avoid the indicated shortcomings, the program of the stage-by-stage specialization and increase of the efficiency of the production of products and the performance of services of intersectorial application should be based on unified methodological principles at all levels. Such a program is entirely capable of being integrated within the comprehensive goal program of the development of machine building, which is being formulated in the country, and of constituting an element of its structural cross section.

The process of the intensification of the specialization of the production of general machine building products within the program should be delimited according to both the technological and the organizational attribute for various types of items and services and different types of subdivisions of the

intersectorial works. At the national economic level one should organize the centralized production at specialized plants of those types of general machine building products, which can be used already at present without cardinal changes in the design and the production technology. The production of blanks--cast, welded, and forged--satisfies this condition to the greatest degree. Tsentrólits and tsentrókúzes are already now playing a significant role in the supply of machine building enterprises with heavy castings and large-series batches of forged and stamped items. The introduction of ganged automated flow lines and other advanced equipment created favorable conditions for the specialization of plants according to the weight and configuration of blanks and the technology of their production, as well as the strengthening of the combination of the sectorial and regional orientation.(19) Capital investments should be allocated in a special-purpose manner for the construction of new plants of this type and the reconstruction and expansion of existing ones.

The specialization and centralization of the production of blanks with the saturation of the market and the more and more complete satisfaction of consumers will lead to the elimination of nonspecialized blank-making works. The production of bearings, the need for which is being met mainly in a centralized manner by means of the products of specialized enterprises can serve as an analogy of this process.

It is impossible to specialize on the scale of the country the production of several types of products of general machine building application, particularly spare parts for specialized and imported equipment, for which deliveries of components have been halted, due to the large range and the negligible volume of needs. The situation with the production of parts and assemblies, the need for which arises occasionally and in small quantities, is similar. For these types of items of intersectorial application it is advisable to carry out the item and technological specialization of production on the scale of the sector and association. Here the regional peculiarities of the formed structure of the pool of equipment of a specific sector of the national economy in the region, as well as the production potential of machine building enterprises and associations of the region and specialized enterprises of the agricultural service should be taken into account.

It is necessary to use the potential of these enterprises for the development of the technological specialization of items and services of intersectorial application when filling the orders of nonmachine building enterprises and organizations. At present the use of this potential for the development of technological intersectorial cooperation on the scale of the region is negligible. This happens due to the lack of interest, first of all economic interest, of machine building enterprises in filling such orders. For the involvement of machine building enterprises of the region in intersectorial cooperation in the production of the types of general machine building products, which are required in the region, it is necessary to use economic stimuli more actively (for example, contractual prices; a higher standard of deductions for the material incentive fund from the profit, which has been derived in case of the filling of orders in accordance with the system of intersectorial cooperation; the payment of special-purpose bonuses to the workers and engineering and technical personnel and the management of

enterprises, which fill these orders, and others). Without the use of economic levers and the increase of the material interest of the machine building enterprises of the region it is impossible, obviously, to expect cardinal changes in this area (to which the poor success rate of the efforts on the development of intersectorial regional cooperation in various regions of the country, including our republic, testifies).

The development of effective economic stimuli and the more active use of commodity-money relations for the improvement of the use of the potential of machine building enterprises are a very important and complex problem, which requires the settlement of an entire set of interconnected questions and in-depth and detailed studies, which goes beyond the framework of the article.

Thus, the basic means of increasing the efficiency of the functioning of the intersectorial works consist, first, in the reorganization of the structure of the intersectorial works in conformity with the basic principles of its improvement and on this basis the carrying out of the stage-by-stage specialization of the production of general machine building products with allowance made for both the strategic interests of the development of the national economy as a whole and the cost accounting interests of specific enterprises and organizations; second, in the development of the entire set of commodity-money relations, the improvement of the existing methods of planning and management, and the development of effective economic stimuli for the more complete use of the created machine building potential.

FOOTNOTES

1. PRAVDA, 9 March 1986.
2. S.A. Kheyman, "The Tasks of Developing Machine Building," VOPROSY EKONOMIKI, No 8, 1981, p 26.
3. L.A. Kostin, "The Reserves of the Use of Manpower Resources," EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA, No 1, 1984, p 26.
4. G.A. Zelenskiy, N.V. Ivanov, "The Problems of Idle Machine Tools," EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA, No 2, 1983, p 78.
5. PRAVDA, 9 March 1986.
6. V.P. Goremykin, "The Analysis of the Pool of Machine Tools Suggests," EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA, No 2, 1983, pp 66-71.
7. A.M. Ilyshev, "Reserves of Intensification in Household Machine Building," EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA, No 4, 1983, p 120.
8. S.A. Kheyman, "The Trends of Scientific and Technical Progress and the Fundamental Combination of the Possibilities of the Scientific and Technical Revolution With the Advantages of Socialism as a Factor of the Increase of the Efficiency of Socialist Production," in the book

"Povysheniye effektivnosti narodnogo khozyaystva" [The Increase of the Efficiency of the National Economy], Moscow, 1984, pp 108, 111, 125; R.I. Polyakov, "Obobshchestvleniye proizvodstva v usloviyakh razvitogo sotsializma" [The Socialization of Production Under the Conditions of Developed Socialism], Leningrad, 1984, 220 pages; M.B. Guseva, A.N. Stoylik, "Several Questions of the Improvement of the Specialization of Socialist Production," IZVESTIYA AKADEMII NAUK SSSR, SERIYA EKONOMICHESKAYA, No 1, 1981, p 56.

9. G.Kh. Popov, "At the Meeting Point of Sectors," EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA, No 6, 1984, pp 65-88.
10. M.B. Guseva, A.N. Stoylik, op. cit., p 56.
11. G.Kh. Popov, op. cit., p 69.
12. S.A. Kheyman, "The Tasks of Developing Machine Building," VOPROSY EKONOMIKI, No 8, 1981, p 30.
13. O.V. Spasskaya, "An Independent Sector—the Industry of Products of General Machine Building Application," EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA, No 6, 1984, p 18.
14. V.Ya. Semenov, "We Are Proposing Intersectorial Production Associations," EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA, No 6, 1984, p 48.
15. "Sovetskiy entsiklopedicheskiy slovar" [Soviet Encyclopedic Dictionary], Moscow, 1979, p 1267.
16. I. Pudkov, "Urgent Problems of the Economics of the Sector," PLANOVOYE KHOZYAYSTVO, No 4, 1984, pp 15-22; P. Stukolov, "Economic and Organizational Levers in the 'Science-Production' System," PLANOVOYE KHOZYAYSTVO, No 5, 1984, pp 50-57.
17. K. Marx and F. Engels, "Soch." [Works], 2d edition, Vol 42, p 123.
18. W. King and D. Cleland, "Strategic Planning and Management Policy," Moscow, 1982, p 29.
19. N.D. Fasolyak et al., "Proizvodstvennoye kooperirovaniye" [Production Cooperation], Kiev, 1983, p 127.

COPYRIGHT: Izdatelstvo "Zinatne", "Izvestiya Akademii nauk Latvyskoy SSR", 1986

7807

CSO: 1814/113

PATENTS AND INVENTIONS

REWARDS FOR INVENTORS, INTRODUCTION OF INVENTIONS

Moscow NIR: PROBLEMY I RESHENIYA in Russian No 24, 16-31 Dec 86 p 4

[Article by Candidate of Economic Sciences N. Linnik, chief of the Department of Economics and the Management of Invention of the All-Union Scientific Research Institute of Patent Information of the State Committee for Inventions and Discoveries: "Key Questions"]

[Text] "I have six certificates of invention and a short length of service as an inventor, and the following questions worry me:

- "1. For precisely what and when should a reward be paid to the inventor?
- "2. And might it be that one should not pay for the invention itself, just for the impact from its use?
- "3. Is it normal that the inventor himself should also introduce his creation? All the same to invent and to introduce are not the same thing. Is it not better that inventors would do their own job, while introduction would take, as they say, a different line?"

M. Kuznetsov

Kharkov

1. I will state frankly: the notion that only introduction gives an invention value is erroneous in principle.

It is well known that inventions, which are protected by certificates of invention, enrich the intellectual property of the country. Thus, inventions, which have undergone examination, become a product which acquires at this moment a completely real value.

The formula of each of them is usually published, moreover, several times and in various publications. And, in my opinion, is to be paid for, as, for example, any high-quality work which is awarded royalties. But so far we are doing this only with respect to job-related inventions.

So far the practice of material stimulation also does not take into account the real specific nature of the development and use of unique objects of equipment (objects of particular complexity, new equipment, at times also expendable equipment). Here everything has been turned upside down. The developers of such equipment, as a rule, receive a far more modest reward than for new equipment which is produced in large series.

This is a direct legacy of the "gross" psychology. The large amounts of the author's reward should not be dictated at all by large runs of the equipment, which is being produced and was developed on the basis of inventions. Such a quantitative dependence, in principle, does not have anything to do with the qualitative essence of the inventor's contribution.

Moreover, large-scale duplication, as a rule, accompanies inventions which do not require significant expenditures on development, production, and use. Of course, this does not at all mean that they are of little significance. But they by no means make a radical change in traditional technologies.

Consequently, the preference for them is based on the immediate satisfaction of the needs of production, reduces in fact to the modernization of obsolete equipment and the established technology, and reflects the fear of production managers to agree to take risks. Thus, truly advanced, "breakthrough" inventions quite often find themselves overboard.

2. In 1984 the European Parliament adopted the special decision "On the Stimulation of European Inventors." As we see, the problem is topical not only in our country.

Many U.S. corporations are using methods of stimulating invention.

For example, RCA (Radio Corporation of America) pays inventors \$200 each for each invention which has merely been accepted for patenting, the largest electrical equipment corporation of the world, General Electric, pays \$150 each, the aerospace corporations Lockheed and Stanley Aviation—\$100 each.

Several American firms also practice the competitive payment of bonuses for the creatively most original inventions (Eastman Kodak, Westinghouse Electric, Allis-Chalmers, and others). And, finally, in a comparatively narrow group of firms, in addition to the incentive reward, they also employ the payment for an invention, which is also practiced in our country, subject to the direct economic impact obtained by the users.

As a whole U.S. corporations spend on the stimulation of the creative initiative of their staff members 10-15 percent of the wage fund. These outlays, according to the testimony of executives of corporations, are repaid many times over. The main thing, for which all American firms strive, is to promptly stimulate "thinking specialists."

In Japan, owing to similar incentives, the number of inventions and efficiency proposals, which are received annually just from industrial firms, reaches on the order of 25 million, that is, approximately 13 proposals per staff member

a year. This is eighty-fivefold greater than the analogous American indicator (0.15 proposal per staff member in the United States).

The largest Japanese corporations of Hitachi, Fuji, and others pay their staff members incentive awards in the total amount of 8 billion yen.

The opinion of Japanese specialists is unequivocal: the incentive award is one of the basic stimuli of technical creativity, and it is necessary to constantly improve its forms.

In our country the tendency to eliminate the incentive award has been appearing in recent times. The supporters of this trend, as was stated above, are worried by the reduction to a minimum of "paper" inventions—those which, they say, the authors themselves "put on the shelf" in advance. They believe that this leads to an increase of unproductive expenditures and in the end entails the devaluation of domestic inventions.

In reality the sum of the incentive reward for inventions, which is paid annually in the country, does not exceed 4 percent of all the expenditures on invention. But then each ruble of the paid reward accounts for an annual economic impact of more than 11 rubles, which is obtained from the use of inventions.

3. The State Committee for Inventions and Discoveries is devoting much attention to the search for a more advanced mechanism of the introduction of inventions.

The threshold of introduction is the highest one in the path of an invention. An integral set of measures, which is capable of uniting the interests of all the participants in the programs of introduction, is necessary for surmounting it.

The following plan of the attachment of the most significant inventions to enterprises, which are the first users, in our opinion, is interesting from this standpoint.

Here are the basic provisions of the plan

"Attachment":

1. First of all, the comprehensive, multilevel evaluation of the national economic significance of inventions—from the moment of their development to inclusion in the plan of introduction—is envisaged. Initially such an evaluation is made by the very developer of the new equipment—the applicant. Then a control evaluation of the significance of inventions and, in necessary instances, the adjustment of the evaluation, which was given by the developer himself, are carried out in the process of state examination. The opinion on the overall evaluation when preparing the decision on attachment is given jointly by the State Committee for Inventions and Discoveries, the State Committee for Science and Technology, the ministry, and the enterprise subordinate to it, to which the invention is being attached.

2. With the consent of all the copperforming organizations the State Committee for Inventions and Discoveries issues to the enterprise, which is the first user, a certificate on the attachment of the invention. But more essential steps also follow this ostensible formality.

3. Planning organs establish strict plan assignments on introduction. The economic interest of the enterprises, which are the first users, is ensured by the guaranteed compensation of all the outlays on the assimilation of the invention. Markups on the wholesale prices for the new equipment, which is based on this invention, are established.

The total amount of the standard profit (from the contractual prices) is left at the disposal of the enterprises with the rendering of technical assistance to the subsequent users of the innovation. And what is more, the act of "attachment" gives the enterprise, which is the first user, the right to priority supply with all types of resources which are necessary for the assimilation of the innovation.

These steps seem to be entirely practicable ones and ones which effectively accelerate scientific and technical progress in its basic directions. However, they do not solve all the problems of using the overwhelming majority of inventions. There is needed here

An Auxiliary Mechanism

It is a question of the introduction of inventions on the basis of the system "inventor's certificate—economic patent—license." In consolidated form the technological cycle of work in accordance with this version is characterized by the following sequence of procedures.

1. After the obtaining of the author's certificate for the invention (the decision of the State Commission of Experts on the recognition of the application as an invention) the applicant turns to a consultative introducing organization (KVO), which is specialized in the theme. It functions on cost accounting principles and gives inventors assistance in the selection of an enterprise, which has the means to introduce the invention.

On a contractual basis the applicant can also entrust the consultative introducing organization with the drawing up of technical specifications. At this stage the information on the invention is delivered not only to the consultative introducing organization, but also—via the information channels of the State Committee for Inventions and Discoveries, which operates in the mode of the service of subscribers on a specific theme—to all potential users of the specific innovation.

2. The State Committee for Inventions and Discoveries informs the USSR State Planning Committee and the State Committee for Science and Technology about especially important, "breakthrough" inventions. The former of them, having received confirmation on the significance of the invention from the State Committee for Science and Technology, includes it in the plans of the development of science and technology or in sectorial plans (for use in the corresponding sectors).

3. On the recommendation of the consultative introducing organization the applicant enters into negotiations with the potential enterprise which is the first user (PP) of his invention and concludes with it a contract on introduction. Such a contract is also possible with the direct participation of the consultative introducing organization, for example, if it drew up the technical specifications.

4. The cycle of these information and legal procedures can conclude with the fact that the enterprise which is the first user receives from the State Committee for Inventions and Discoveries an economic patent. It gives the enterprise which is the first user the right to the compensation of the outlays on the preparation of the production (use) of the invention and even the right to additional revenues from the subsequent sale of a license to other enterprises which are interested in this invention. The version of the compensation of outlays of the enterprise which is the first user from special-purpose innovation funds of the corresponding ministries and departments, including the State Committee for Inventions and Discoveries, is also possible.

In accordance with the results of such negotiations with other interested enterprises the enterprise which is the first user concludes contracts on the compensatory transfer of the specifications for the invention for its subsequent duplication.

Here the author's reward could be paid in proportion to the amount of the license agreements of the enterprise which is the first user with other (subsequent) users of the invention, the economic impact, which was derived at the enterprise which is the first user, and other positive impacts which are created by the invention. The payments of this sort should be made in conformity with the mutual contractual obligations, which have been established between the enterprise which is the first user and the applicants. For example, in the form of the traditional 3-percent deductions from the cost of the license or the total revenues of the enterprise which is the first user with allowance made for their maximum amount, which is established by legislation.

Thus, the applicant-inventor in accordance with the procedure of obtaining the author's reward would deal now only with the enterprise which is the first user. In this way all the ordeals of the inventor, which thus far have been inevitable and are connected with the search for enterprises, which use his invention, and, what is the main thing, with the obtaining of the legitimate reward from these enterprises, would be eliminated.

In combination with the directive planning of the introduction of highly efficient, "breakthrough" inventions such a mechanism might prove to be a quite effective catalyst of scientific and technical progress.

Several words in conclusion.

Precisely the enterprise which is the first user receives all the basic benefits, and they are considerable. The need for the realization of the

allocated assets in accordance with innovation funds will undoubtedly be an additional and strong stimulus not only for the enterprise which is the first user, but for all users.

The proposed version of the mechanism of the active introduction of inventions will make it possible, finally, to combine in practice the interests of the inventor and the coperformers of the programs of introduction. The possibility of the efficient purposeful division of labor between inventors and "introducers" will be afforded.

7807

CSO: 1814/108

REJECTED, UNUSED INVENTIONS AS SOURCES OF IDEAS

Moscow IZVESTIYA in Russian 8 Dec 86 p 2

[Letters to the editor: "Nuggets in the Paper Heap. Three Letters on an Important Theme"; first paragraph is IZVESTIYA introduction; last paragraph is IZVESTIYA conclusion]

[Text] These letters arrived at the editorial office at the same time, were in one pile, and lay in such a sequence that they constituted as if a verbatim record of a conversation at a "round table." The theme of the discussion is not new—the question has been repeatedly posed in the press, including on the pages of our newspaper. This, however, does not decrease its urgency, for it is a question of major reserves of scientific and technical progress, which are not being used today.

Inventions are one of the indicators of the activity of scientific subdivisions. There are no fundamentally new solutions--hence, the jobs performed by the collective lag behind the requirements of the day and behind the world level of development of this technical direction.

During the time of the existence of our laboratory its works have been defended by 48 author's certificates for inventions. Is this a lot or a little? In our opinion, it is a lot. But this number could have been at least twofold greater.

It would seem that not only developers, but also experts of the All-Union Scientific Research Institute of State Patent Examination should be interested in the objective evaluation of a new idea and in the preservation of priority for our country. Actually this is far from the case, to which our 18 years of experience of interrelations with the experts of the Department of Machine Tool Building of this state institution attest.

In practice a positive decision was not received immediately on any application submitted by us--in each case the exchange of two or three letters with the expert commission was required. In its initial decision, as a rule, known technical solutions, which have nothing in common with those being filed, were contrasted. The belief is created that either the examination is being made superficially, only for the sake of the "gross" indicators, or the skill of the experts leaves much to be desired.

Having received a rejection, the applicants begin to study the contrasted materials, on which from 1 to 3 weeks are spent. Then the writing of a well-founded answer follows--reckon another week. The matter usually does not end with one rejection, a second one arrives....

In the recent past we received an unfounded objection to one of the applications. While we "disputed" the appraisal, a similar invention was patented in the FRG, priority for the country was lost. Do they calculate in the State Committee for Inventions and Discoveries how much each unfounded objection costs the state?

No one at the All-Union Scientific Research Institute of State Patent Examination bears responsibility for such "mistakes." But in each such case the introduction of an innovation is delayed. According to the instructions an introduced technical solution will be considered an invention, if not more than 4 months have passed from the moment of introduction to the submitting of an application. Foreseeing red tape with the examination, researchers prefer not to hurry up with introduction until the final decision. The irrecoverable losses, which are caused by such delays, are enormous.

The last time we were faced in general with a flagrant case. We submitted an application for a unit which is several fold more productive than the makes now being produced. They turned us down three times and contrasted newer and newer technical solutions which are very far from the declared one. In the end one of the experts declared to us: "You will not receive a positive decision, since the formula of the invention, which was presented by you, is incorrectly formulated, and I do not intend to suggest to you the correct one." The question was considered twice in the Control Council of the State Committee for Inventions and Discoveries, but at the first meeting they did not even hear us out, while they did not invite us to the second one. It is already clear to us that we did not receive support there.

In our opinion, the need has arisen to hold experts more strictly accountable for an unfounded rejection. Inventors should see in experts not opponents, but allies.

[Signed] Candidate of Technical Sciences M. Shainskiy and other staff members of the laboratory (in all eight signatures)

Voronezh

A truly gold, but so far, alas, passive collection of unimplemented inventions has accumulated in the archives of the State Committee for Inventions and Discoveries. And many of them still retain if not patent value, then practical topicality.

The time has come to make an audit of this "bank of technical ideas" and to transfer to the assets of the national economy the maximum number of advanced innovations.

It is necessary to strive for the maximum implementation of inventions, first of all those of intersectorial and sectorial importance. And to begin precisely with the archive collection of the committee. To assign to the State Committee for Inventions and Discoveries and the State Committee for Science and Technology the duty of the responsible choice of innovations, which have become "stale" and have not been introduced extensively enough and have retained novelty and technical and economic efficiency, if not on the world, then on the domestic scale. It is necessary to enlist in this work the services of new equipment of ministries and departments, specialists of scientific research institutes and higher educational institutions, and the active members of the All-Union Society of Inventors and Efficiency Experts and the All-Union Council of Scientific and Technical Societies. Only such a broad coverage and the collective nature of discussions will make it possible to cope with this imposing task.

The very specification of the period of "prescription" is difficult, for frequently the conception of an innovation for years leads the possibilities of its materialization. For example, the first invention of the authors of these lines, which originated in connection with the then designs of the Baykal-Amur and Caucasus freight handling railroads, could have been introduced only in our days during the construction of these and other similar objects.

Too many inventions have not been implemented due to personal ambitions and departmental hostility toward others' ideas. The pseudo-objective conclusions of "authorities" from the main institute--"monopolists" frequently induced talented inventors to give up further "paper battles" with the All-Union Scientific Research Institute of State Patent Examination. For example, the fate of many innovations of the brilliant engineer, designer, and process engineer V. Bakhchivandzhi is unfair. A portion of them are protected by inventor's certificates, but many were only announced: Vsevolod Yevgenyevich valued his time and considered it wasteful to spend it on disputes with experts who are less erudite than he is. Who will worry now about the modification and introduction into the national economy of the very rich legacy of this inventor?

[Signed] Candidate of Technical Sciences V. Tikhomirov

Leningrad

It was possible some 10-15 years ago to mine gold, platinum, and silver not in mines and placers, but in the city dumps of the enterprises of our industry. And they did mine it--dodgers and people pursuing their own interests, who took extensive advantage of the negligence and slowness of our economic managers. Today waste products containing precious metals are being reclaimed, by which enormous material and labor expenditures are being saved.

But is it not time to do the same thing also at the dump of rejected applications for inventions? And such a dump exists--this is the archive at the All-Union Patent and Technical Library which is located in the same building as the All-Union Scientific Research Institute of State Patent

Examination. In this case the State Committee for Inventions and Discoveries is performing the role of the negligent manager.

I offer my apologies to the workers of the All-Union Patent and Technical Library for the fact that I called the archive of rejected applications for inventions, which is being maintained in an exemplary manner, a "dump." I used it because the named applications have been recognized as rejects, the waste products of inventors' activity. The State Committee for Inventions and Discoveries and the All-Union Scientific Research Institute of State Patent Examination have never owned the rejects and attribute them entirely to the authors of technical ideas—with the exception of those instances, when out of the nonexistence of the archive an application many years old suddenly rises and requires its recognition for the sake of the defense of domestic priority. By the way, an reader of the All-Union Patent and Technical Library, including people who do not have anything to do with technical creativity, can use free of charge the archive collection of rejected applications for inventions.

As they say, "you will not move with a cannon" the readers at the All-Union Patent and Technical Library, there are so many of them, it is not that way at patent libraries—and everything is due to the fact that, apparently, here the possibilities of discovering grains of "precious metals" are extensive. Let us take a look at what fell on the shelves of the archive.

First, these are applications, which meet all the demands on a modern invention, but were rejected due to unfounded attacks of the expert commission or due to the negative conclusion of sectorial scientists. Another group is inventions, which contain solutions of modern technical problems, but do not have world novelty, substantial differences, or an extremely high positive impact. These solutions can be qualified as technical improvements. Many of them in case of mass introduction can yield millions of rubles. Moreover, applications for inventions, which contain a promising statement of the problem, but do not contain its solution, are stored in the archive.

The belief is created that the majority of rejected applications come to be on the shelves of the archive entirely without reason. They should be defended by protective documents and receive places in sectors, and not serve as a culture medium for dodgers and people pursuing their own interests.

The All-Union Scientific Research Institute of State Patent Examination does not have a state law on the examination of inventions, but is guided by stray documents which in practice do not regulate the actions of its workers. In the section on the consideration of applications of the Statute on Discoveries, Inventions, and Efficiency Proposals only clarifications on the time of consideration are cited, but nothing is said about the principles and essence of examination.

Something is said about this in the instructions, but the monitoring of their observance is not being carried out either on the part of the public or by the state. The Control Council of the State Committee for Inventions and Discoveries, which includes a large number of highly paid specialists, does not make the "weather" and does not have the proper legal support. The executives of the All-Union Society of Inventors and Efficiency Experts are

also not bursting into the battle for technical progress and for justice, but this is already a conversation on another theme.

The expert commission for inventions has been granted the right to permit everything, which no other state institution has. Should one be amazed at the violations of legality and the duration of the process of examination, unfounded rejections, and the suppression of the principles of socialist morals?

Apparently, this is why the percentage of individual applicants declined to only a few percent, but how many enthusiasts previously strived to make their contribution to technical progress.

Life dictates the need for the immediate reorganization of the examination of inventions on the principles of legality and honesty and with the use of all types of monitoring and all forms of responsibility for the decisions being made.

The time of changes in the matter of invention has arrived. Next year the passage of the new Law on Inventions...is proposed, but time does not wait, there are problems which it is necessary to solve today. Does the State Committee for Inventions and Discoveries not see the shortcomings of examination and not read the claims and complaints, which arrive at its address and leak out in the press?

[Signed] I. Shchelkunov, Inventor

Leningrad

The letters have been published, but the correspondence "round table" is not ceasing its work. We invite inventors, lawyers, patent experts—everyone who is not indifferent to the fate of effective technical solutions which are covered by archive dust—to share their opinion on the means of solving the problem touched upon.

7807

CSO: 1814/111

INDUSTRIAL AND COMMERCIAL APPLICATION

METHOD OF CLEANING, PROTECTION OF PIPELINES

Moscow NTR: PROBLEMY I RESHENIYA in Russian No 24, 16-31 Dec 86 p 3

[Article by O. Lebedeva: "The Collision With an Innovation, or a Note on the Minutes of the Meeting of the Scientific and Technical Council of the State Committee for Inventions and Discoveries"]

[Text] Petroleum, gas, substances for the chemical and other sectors of industry, water—all this is delivered to the consumer through pipelines. But they have the annoying quality of breaking down. For example, at present in the country it is necessary to remove the products of corrosion from about 750,000 kilometers of pipelines, moreover, to repair the inside surface on 450,000 kilometers and to replace 200,000 kilometers with new ones.

A method of the simultaneous cleaning and corrosion protection of the inside surface of pipelines was developed for the first time in the world at the Yuzhvodoprovod Trust of the USSR Ministry of Land Reclamation and Water Resources (Krasnodar). This is the hydrobarodynamic method, in case of which cleaning proceeds not by mechanical scrapers, but due to the appearance of cavitation.

The method is suitable for the cleaning of practically all types of pipelines with any degree of fouling. Its working medium—a tool consisting of metal lobes—is one-seventh to one-fiftieth as expensive as the cleaning units which are used in other methods. The motor life is three- to one hundred-fiftyfold greater and the passability in constrictions and at turns is much better.

The hydrobarodynamic method has many victories over corrosion to its credit. By means of it more than 2,000 kilometers of pipelines have already been cleaned: for example, the 1,750 kilometer Ishimskiy pipeline, which practically ceased to operate back in 1972, allowing only 30 percent of the water to pass. After cleaning in 1978 it showed a capacity...greater than the design capacity. The point is that the tool "polished" the irregularities of the interior wall and eliminated the irregularities of the welds and other sources of resistance. While "sleeves" made of carbon plastic are being successfully used for the repair of pipelines which have lost tightness and strength. Moreover, they also operate in any supply lines, even those laid in quicksands. And they do not require the uncovering of the pipes.

Such in brief are the peculiarities of the hydrobarodynamic method of cleaning and protecting pipelines, which was developed at the design bureau of the Yuzhvodoprovod Trust by four inventors headed by chief designer V.V. Shishkin.

The first steps of the innovation have already shown that it is capable of yielding an economic impact of many millions of rubles and of facilitating work of more than one sector of the national economy. However, in order to show its possibilities, any invention should meet the user's interest and readiness for introduction.

At the meeting of the Scientific and Technical Council of the State Committee for Inventions and Discoveries, which took place at the end of November of this year, it turned out that by no means all specialists of water resources intend to use the "Shishkin method" (that is how they nicknamed this invention). They say that they have worked so far with imported units. Besides, we are producing our own hydromechanical units. Why replace them with "aliens"?

It seems that the results of the examination of the Shishkin method in the Interdepartmental Commission attached to the USSR State Planning Committee, which is authorized to include in the national economic plan the assimilation of the most effective--valued in the billions of rubles--inventions, will finally dispel such a purely departmental distrust of an "alien" innovation.

To wait for instructions is not to act. But they decided precisely to act at once at the Ukrainian Petroleum Association of the Ministry of the Petroleum Industry. B.I. Konyshchuk, chief of a division of this association, said at the meeting of the scientific and technical council:

"The news about the Shishkin method was stunning for me. And here is why. In my line of work I deal with new technologies of increasing the petroleum recovery of formations. As is known, for the present we take less than half the petroleum from them. All the rest remains in the ground. Not that long ago they began to use here thermal methods of increasing petroleum recovery. Here we either feed heat from the surface or ignite the formation--we burn a portion of the unextracted petroleum, thereby increasing the mobility of the rest, in order to raise it. And here we were faced with corrosion, which can reduce to naught the new technology.

"The cost of one oil or gas well is hundreds and hundreds of thousands of rubles. In the country there is a great multitude of them. And each one is corroding.

"Having a hard time with the solution of these problems, literally with a headache, 2 weeks ago I suddenly heard about the Shishkin method. I seized hold of this matter and found Shishkin. On Saturday we got in touch by telephone; he is in Moscow, I am in Kiev. I asked him one question: Is it possible to use all this in a vertical well? 'Yes.' Then I dropped everything and came here.

"I, of course, will also report in the Ministry of the Petroleum and Gas Industry that this matter must be developed. But since the association, which I represent, also has its own possibilities, I promise that with the assistance of the Yuzhvodoproved Trust we will introduce the method here."

7807

CSO: 1814/108

INTRODUCTION OF LASER DOPPLER METER DELAYED

Moscow IZVESTIYA in Russian 1 Nov 86 p 2

[Article by Academician Yu. Nesterikhin, director of the Institute of Automation and Electrometry of the Siberian Department of the USSR Academy of Sciences, with a commentary by IZVESTIYA correspondent A. Illarionov (Novosibirsk): "The System of Introduction and Mechanisms of Repulsion"]

[Text] In the roaring pipe rolling shop of the Novosibirsk Metallurgical Plant the laser doppler meter has been operating on the reducing mill for more than 2 years now. The Institute of Automation and Electrometry of the Siberian Department of the USSR Academy of Sciences in conformity with the decision of the Council for the Promotion of Scientific and Technical Progress attached to the Novosibirsk Oblast Committee of the CPSU accomplished a quite difficult task: with great precision to measure by the contactless method the velocity and length of incandescent pipe. The institute produced and jointly with specialists of the plant installed an operating model of the meter on the running mill.

What is this innovation giving the plant? The opportunity to automate rolling. Today the uniform cutting of the produced pipe is being carried out by means of it, which saves about 100,000 rubles a year.

What goal did the institute pursue, having engaged in the difficult matter—the development of an instrument for plant conditions? It is necessary to demonstrate that domestic laser meters have achieved such a level that they will be able to operate reliably under shop conditions.

Knowing that the problem of the measurement of the speed and length of items in the process of continuous production is very urgent, scientists naively assumed that it is worthwhile for them to prove "the theorem of existence" of an instrument at the works, since interested sectors of industry will immediately begin its series assimilation.

Back in 1984 the Siberian Department of the USSR Academy of Sciences included this meter among its completed developments, which were suggested through the USSR State Planning Committee for industrial assimilation. The State Planning Committee recommended to the USSR Ministry of Instrument Making, Automation Equipment, and Control Systems to assimilate it. The leadership of the

ministry agreed with such a recommendation and indicated the performer--the Tbilisi Analitpribor Scientific Production Association. Representatives of the scientific production association twice visited the institute and plant. The high level of the development was noted in the final report.

But half a year had not passed when the letter of USSR Deputy Minister of Instrument Making, Automation Equipment, and Control Systems Ye. Smirnov with the refusal to assimilate the velocimeter on the grounds that it ostensibly has parameters which are worse as compared with the instrument of the Messmetallurgie firm (the FRG), arrived at the institute.

The refusal of the Ministry of Instrument Making, Automation Equipment, and Control Systems is not understandable. It should be added that this ministry, which at one time purchased a license in the FRG, attempted unsuccessfully for 5 years to develop such an instrument on its basis and halted the work on the cunning pretext that the components necessary for such production are not available in the USSR.

About what technical progress and acceleration is it possible to speak, if our system of introduction allows such faults?

IZVESTIYA Correspondent A. Illarionov comments

It was always a difficult matter to fit academic developments to the specific nature of a specific enterprise. With the laser meter from its first steps in the shop everything went marvelously successfully. Until the time came to put the instrument into series production.

The further I looked into the documents and the correspondence on the need for the duplication of the instrument, the more often the sensation that somewhere, at some time I had already had occasion to come across this story, visited me.

Another academic institute--the Institute of Mining of the Siberian Department of the USSR Academy of Sciences--developed and began the production as production prototypes at mines of Siberia of a new vibrating delivery and loading feeder. I will stipulate that vibrating transport in mining today is just as hot a problem as the laser meter is in rolling. In addition to high capacity, the new vibrating feeder was also distinguished by the enviable ability to operate reliably under the most unfavorable conditions, for example, having been loaded with a 1,000-ton layer of ore.

The official opinions of Siberian miners about the new mechanism were most well-disposed.

Before me are two letters of two deputy ministers of the completely opposite content. On 6 December 1985 one of them, G. Kavelerov, reported to the Institute of Automation on the agreement by the ministry to take part in the development of the Tbilisi Analitpribor Scientific Production Association. Just half a year later, on 15 June 1986, another deputy minister, Ye. Smirnov, reports the impossibility of delivering the meter to the works due to the

significant superiority of the foreign analog. We already know that here, too, they did not manage without the impermissible adjustment of the facts.

At one time the staff members of another institute of another sector--the VNIPIrudmash--denied the mining institute the coordination of the technical charts of their vibrating feeder, attempting to base themselves on the same manipulation of comparative indicators. Here is what happened: engineers from different sectors and different cities are not acquainted with each other, but the methods of refusing consent to series production are the same.

No, this is not an accident, not a coincidence. This is the result of the techniques of evading the introduction of new equipment, which were developed over the decades. Such postponements completely suited the supporters of the introducing "swing."

Today they have begun to feel: everything around is changing irreversibly. Some of them have begun to worry. In response to the article of Academician Ye. Shemyakin about the fate of vibrating feeders (IZVESTIYA, No 217, 1986) the editorial board received the reply of V. Polyantsev, chief engineer of a main administration of the USSR Ministry of Heavy and Transport Machine Building. "The facts presented in the article," he reports, "actually occurred.... The article was studied at the VNIPIrudmash. The need for the improvement of organizational and technical work was indicated to the workers of the institute."

Having read about the belated recognition by the Ministry of Heavy and Transport Machine Building of the vibrating feeder, I thought that if the matter with the laser meter thus far had developed by analogy, a similar letter should also be expected from the Ministry of Instrument Making, Automation Equipment, and Control Systems. And it was not slow in arriving. Deputy Minister G. Kavelerov, with whom we are already acquainted, ordered the Analitpribor Scientific Production Association within a month's time jointly with the Institute of Automation to formulate a technical assignment for such an instrument. It would be possible to rejoice, if the month's time had not been up in October, while the representatives of the scientific production association, in spite of the categorical order of the deputy minister, never showed up at the Institute of Automation.

For all the respect for the Ministry of Instrument Making, Automation Equipment, and Control Systems it is impossible not to ask Minister Comrade M. Shkabardnya a reasonable question: What kind of rules are there in the ministry headed by him with the examination there of scientific developments, if two deputy ministers give contradictory answers to the same question?

It is necessary to add to the administrative steps of the acceleration of introduction economic steps: it is necessary to recover from those to blame for evasions of introduction the harm done by them to the national economy, on the basis of the missed economic impact.

7807

CSO: 1814/110

BRIEF

RECONDITIONING OF TURBINE ROTORS--So that a turbine would operate an extra 5 years, it is sufficient to remove from its rotor a small layer of worn out metal. This was demonstrated during the full-scale experiments conducted at the Starobeshevskaya and Zmiyevskaya GRES's by workers of the Nadezhnost mashin Interbranch Scientific Technical Complex. The research conducted by the staff members of the interbranch complex was the basis for the program of the retooling and renovation of thermal electric power plants of the country for 1986-1990. [Text] [Moscow NTR: PROBLEMY I RESHENIYA in Russian No 23, 2-15 Dec 86 p 2] 7807

CSO: 1814/111

REGIONAL ISSUES

PLANS OF DEVELOPMENT OF ARMENIAN SCIENCE NOT FULFILLED

Yerevan KOMMUNIST in Russian 3 Dec 86 p 2

[Article by Chief of the Science Department of the Armenian SSR State Planning Committee A. Agababov under the rubric "By the Routes of Scientific and Technical Progress": "On the Paths of Reorganization"; capitalized passages published in boldface]

[Text] The times that we are going through dictate their own laws. The pace, quality, acceleration--today we are checking all our deeds against these tasks. While the analysis of the results of the past 5-year period give a serious reason for reflection.

For the republic as a whole 92.9 percent of the five-year plan of the introduction of new equipment was accomplished. The greatest number of unfulfilled measures occurred at enterprises of the Ministry of the Automotive Industry, the Ministry of the Construction Materials Industry, the former Ministry of Agriculture and Ministry of the Food Industry, the Ministry of Industrial Construction, and other departments.

AT THE 28TH ARMENIAN CP CONGRESS, AS WELL AS THE APRIL (1986) ARMENIAN CP CENTRAL COMMITTEE PLENUM IT WAS INDICATED THAT THE ECONOMY OF THE REPUBLIC FOR THE PRESENT IS SLOWLY CHANGING OVER TO INTENSIVE METHODS OF DEVELOPMENT, WHICH ARE BASED ON THE INTRODUCTION OF THE ACHIEVEMENTS OF SCIENCE AND TECHNOLOGY IN PRODUCTION.

What is the reason for the formed situation? The inadequate connection of science and production.

It was noted quite correctly at the April Armenian CP Central Committee Plenum that the republic Academy of Sciences and its institutions for the present are not ensuring the goal-oriented coordination of the basic directions of the development of basic science. A mechanism of the effective choice of new ideas and the rapid implementation of the results of basic research by sectorial scientific institutions is still lacking.

At the majority of institutions purposefulness and topicality do not distinguish the thematic plans of scientific research work. This is having the result that the proportion of the expenditures on the most important

scientific and technical programs in the area of the natural and social sciences does not exceed 35 percent.

The thematic plans of a number of institutions, like the academic institutes of mechanics, physiology, and agrochemical problems and hydroponics, do not find reflection at all in the national economic plan. The situation is obviously abnormal.

The lack of goal-oriented themes had the result that a number of scientific institutions in recent years in practice have not produced proposals on the introduction in the national economy of the results of completed research.

The Presidium of the Armenian SSR Academy of Sciences is not providing a timely evaluation of the scientific and technical activity of subordinate institutions and planning and technological organizations in conformity with the procedure which was approved by the USSR State Committee for Science and Technology. Such a position is leading to the lack of control in the determination of the themes of scientific research work and, as a consequence, it, being based on established traditions, does not take into account the present demands.

And what is the situation with the VUZ potential?

In recent years it has increased significantly. The amount of expenditures on science and scientific service for the republic Ministry of Higher and Secondary Specialized Education alone in 1986 will come to 4.3 million rubles. Here financing from the budget will come to 1.5 million rubles.

The great scientific potential of higher educational institutions and their scientific personnel, as was noted at the April (1986) Armenian CP Central Committee Plenum, should make a sharp turn in the direction of the demands of production. They are called upon to help solve the urgent scientific and technical problems which are arising in the national economy of the republic. However, budget financing is being dispersed among numerous problem laboratories. As a rule, this is occurring without the proper return and effectiveness of expenditures.

The jobs, which have been completed by the scientific subdivisions of higher educational institutions in accordance with economic contracts in the amount of more than 3 million rubles annually, in most cases are insufficiently effective, since they are not being introduced in the national economy of the republic.

IN ORDER TO PRODUCE A RADICAL CHANGE IN VUZ SCIENCE AND TO ACHIEVE ITS TURN IN THE DIRECTION OF THE DEMANDS OF PRODUCTION, THE REFORM OF THE SYSTEM OF THE PLANNING AND MANAGEMENT OF THE ENTIRE PROCESS, WHICH IS BASED ON THE ELIMINATION OF WORK ON MINOR THEMES, WHICH IS CHARACTERISTIC OF INDIVIDUAL SUBDIVISIONS, AND OTHER MEASURES, IS REQUIRED.

One of the basic criteria of the increase of the responsibility of the managers of scientific subdivisions of higher educational institutions of the

republic is the indicators of the effectiveness of the introduced developments with respect to the expenditures on carrying them out.

Obviously, research, which is aimed at the increase of labor productivity in the sectors of the national economy of the republic on the basis of the mechanization and automation of production and the introduction of robots, manipulators and flexible machine systems, and new labor-, materials-, and energy-saving technological processes, should prevail in the thematic plans of the higher school. An important condition of this is the expediting of developments which are connected with republic scientific and technical programs.

The Commission of the Armenian CP Central Committee and the Armenian SSR Council of Ministers for Scientific and Technical Progress last year approved a list of 17 republic scientific and technical programs for the 12th Five-Year Plan. It was envisaged to formulate the programs in a short time. However, a number of main scientific organizations displayed a negligent attitude toward the question of state importance--to date detailed republic scientific and technical comprehensive goal programs have not been formulated.

For example, Yerevan Polytechnical Institute imeni K. Marx has not yet submitted programs on the mechanization and automation of manual labor in the sectors of the national economy (including the introduction of manipulators, robots, and robotic complexes) and on advanced methods and means of using production waste (in the leading sectors of the national economy).

The Institute of Geology has not formulated a program on environmental protection and the efficient use of natural resources, the Institute of Agriculture--on the commitment to active agricultural use of previously written off lands, the development of mountain slopes, the increase of the fertility of soils, and the control of erosion.

Some work on the introduction of the achievements of science in production is being performed at sectorial scientific research institutions of the republic. A technological process of the waste-free conversion of nonmetallic rocks by the hydrochemical method into a compound glass raw material--canasite for the production of glass for various purposes--was developed and assimilated at the Kanazit Pilot Plant of the NIKS of the Ministry of the Construction Materials Industry. The Armstanok Scientific Production Association organized the production of automated equipment for balancing the rotors of electric motors. A computer-aided design system of electrical machines was developed and put into operation at the All-Union Scientific Research, Planning, and Design Institute of Integrated Electrical Equipment.

But there are no grounds for contentment and complacency.

The scientific activity of some sectorial scientific institutions of the republic is cut off from vital problems, namely those which production associations and enterprises are called upon to solve. A graphic example was cited at the April (1986) Armenian CP Central Committee Plenum concerning the activity of the Armenian Affiliate of the All-Union Scientific Research Institute of Chemical Reagents and Ultrapure Substances. The scientific

institutions of the agricultural type are cut off to a significant degree from the problems of the development of the agroindustrial complex of the republic.

One of the principles of the further improvement of the planning of the development of science and technology on the basis of the goal program method is the evaluation of the quality of the scientific research problems being planned and the establishment of the economic effectiveness of their introduction in the sectors of the national economy. This is utterly and completely the task of economic scholars.

Work experience confirms: an important condition of the rapid introduction of the results of scientific research work is the organization of scientific production associations. The conditions and possibilities to carry out the unified supervision of workers of science, designers, planners, and production are created precisely in them.

The Armstanok, Armselkhozmeckhanizatsiya, Promavtomatika, Nairit, and other scientific production associations are operating in the republic. By all their practice and experience they confirm the importance and promise of associations.

At the same time in a number of such sectors of the national economy as the chemical industry, instrument making, machine tool building, and agriculture, where scientific institutions, planning and design organizations, and production enterprises of the corresponding type exist, proposals on the organization of new scientific production associations are being prepared extremely slowly.

The possibility of establishing scientific production associations in the system of the Academy of Sciences and the republic Ministry of Higher and Secondary Specialized Education, particularly in the area of the production of refractory metals, laser units, and so on, is also not ruled out.

THE TASKS OF ACCELERATING SCIENTIFIC AND TECHNICAL PROGRESS IN THE REPUBLIC REQUIRE THE IMMEDIATE SETTLEMENT OF THE QUESTIONS OF THE ORGANIZATION OF NEW SCIENTIFIC PRODUCTION ASSOCIATIONS AS ONE OF THE ADVANCED FORMS OF THE MANAGEMENT OF SCIENTIFIC AND TECHNICAL PROGRESS.

To think and work in the new way when solving the problems of the introduction of scientific developments also means to be able to eliminate departmental barriers. For many developments of an intersectorial nature are being carried out. Useful experience, which teachers much, exists in this area. In particular, the experience of the Ukrainian Academy of Sciences on the establishment of engineering centers. Unfortunately, the Academy of Sciences of our republic so far is not adopting this experience. But it would also be possible to use it successfully at the academic institutes of physics research, fine organic chemistry, and others.

The civic position of the scientist makes it incumbent to display consistency, great activeness, and persistence in overcoming difficulties. It is the

responsibility of scientists that new scientific and technical solutions would have economic efficiency and patentability and would conform to the best models in the world.

7807

CSO: 1814/111

MOLDAVIAN INTERBRANCH CENTER FOR INTRODUCTION OF INVENTIONS

Moscow IZVESTIYA in Russian 10 Jan 87 p 1

[Article by IZVESTIYA correspondent E. Kondratov under the rubric "An Event and Opinions" (Kishinev): "A Cost Accounting Invention Firm Has Been Established"; first paragraph is IZVESTIYA introduction; last two paragraphs are IZVESTIYA conclusion]

[Text] I will arbitrarily call the newborn organization a firm, its official name is the Interbranch Scientific Technical Center (MNITs). Established under the Frunzenskiy Rayon Soviet Executive Committee of Kishinev, it is meant to help enterprises of the city to embody the most advanced scientific and technical ideas, to introduce inventions, and to improve the systems of management. The center is a public organization, which operates, however, not free of charge, but on the basis of strict cost accounting, for it will have to live on the revenues from the filling of orders of enterprises.

Engineers, workers, and scientists are being enlisted in the solution of creative problems—once again in accordance with contracts—if necessary they will be brought in from other cities and scientific centers of the country. The two main "firm" conditions are as follows: the first--the innovation being introduced should be at the level of an invention; the second--the client forks out only after the practical introduction of the idea.

Money will appear at any moment: two large orders of the Zorile Shoe Association are already close to completion. By the end of the five-year plan the firm intends to complete contractual jobs worth 5 million rubles.

However, do the real conditions exist to accomplish everything contemplated?

F. Petigin, secretary of the Frunzenskiy Rayon Committee of the Communist Party of Moldavia:

"It pains one to realize that hundreds, thousands of folders with efficiency proposals and inventions lie as dead weight at enterprises, without finding embodiment. Why? The turnover is demoralizing production workers, there are not enough of the needed specialists. At any works there are heaps of 'bottlenecks' and unsolved technical problems. Meanwhile in our rayon alone there is an enormous creative potential--an entire army of engineers and

scientists of various specialties, who do not know where to apply their knowledge and implement bold ideas. The center-agent not only will unite and aim the bright minds at the accomplishment of specific technical tasks, but will also stimulate directed creative research.

"The rayon is prepared to become the testing ground for a large-scale experiment which can be, without exaggeration, of all-union importance. But will the Council of Ministers, the State Planning Committee, the State Committee for Material and Technical Supply, and the Ministry of Finance of the Moldavian SSR support us? That is what worries us."

Ye. Solovyev, director of the center:

"I am utterly convinced: if our center does not have its own technical base, we will also not be able to do a small portion of what we want to do and what we could do. The practical 'breaking in' of technical ideas should take place in the heart of the firm itself. Under the conditions of the client enterprise creative freedom will inevitably be limited. Now orders are coming to us one after the other. The printing combine posed eight technical problems, the solution of which will yield a profit of 350,000 rubles. For the House of Models we are seeking means of limiting the idle running of sewing machines.

"There are a large number of ideas, there is also no shortage of inventors and scientists, but for the present there is no technical base. We reached an agreement, true, with two vocational and technical schools, are thinking about the leasing of machine tools, and hope that plants will help with equipment and machinery. But we do not have production area proper! We were about to choose the old building of the oxygen station, but were turned down.... Although we are still just beginning to earn assets, I believe that one day we will have computers, NC machine tools, and lasers.... But our 'product' is extremely necessary already today."

V. Prosnyak, engineer of the Elektromashina Plant, winner of the B. Glavan Prize:

"We inventors have been dreaming a long time about such a firm-agent. I know a large number of engineers and scientists, who have interesting inventions, but do not know where to use them. Working alone, you will not go farther than the idea itself—experiments, prototypes, and tests are necessary. We go and offer our ideas to enterprises—introduce.... And they are not against it, as, for example, was the case at the Bukuriya Factory, but there are not enough forces, specialists. The firm will be able to establish entire creative groups with, for example, the following structure: a designer, industrial designer, process engineer, mechanic. Our first experience of work for the Zorile Association has already shown how interesting such cooperation also is for the physicist, chemist, and engineer."

S. Kulchitskiy, director of the Combine imeni Kalinin, chairman of the council of directors of the rayon:

"I believe that enterprises will pay without stinting for the introduction of fresh ideas. But the base of introduction, in my opinion, should be at the enterprises themselves. Please, come with ideas--we will give the machine tools, equipment, and materials. Only create. But to build workshops for the firm and to create a technical base for it is, it seems to me, an idle venture. For the tasks will change all the time, and namely the enterprise, which is interested in the solution of its own problem, is capable of creating for the creative group the appropriate conditions, which the firm itself will not always be able to do."

The establishment under the rayon soviet executive committee of a firm-agent is a response with a living deed to the government decrees on the strengthening of the role of soviets in the socioeconomic life of society. It was conceived in an interesting, bold manner and with a future. If only departmental and bureaucratic barriers would not get in the way. Financiers have already attempted to close the current account of the firm, but had second thoughts and changed their mind, having shown that they are also ready to keep pace with the times. It is worse with the base and facility. Having visited the oxygen station, I learned with amazement that they are turning over the sooty stone barn in the plant's backyard, which was nearly promised to the firm, to...the Zhok Ensemble.

The firm-agent--the offspring of reorganization--needs an operating workshop, if not this one, then another. The main thing now is to return to people the belief that it is all the same worth seeking, devising, and inventing.

7807

CSO: 1814/111

MARCHUK ON DEVELOPMENT OF FAR EASTERN SCIENCE

Moscow SOVETSKAYA KULTURA in Russian 4 Dec 86 p 2

[Interview with President of the USSR Academy of Sciences Academician Guriy Ivanovich Marchuk by SOVETSKAYA KULTURA correspondent M. Poboronchuk under the rubric "Yesterday, Today, Tomorrow" (Vladivostok): "The Horizons of Large-Scale Science"; date not given; first paragraph is SOVETSKAYA KULTURA introduction]

[Text] A field meeting of the Presidium of the USSR Academy of Sciences was held in Vladivostok. Our correspondent interviewed President of the USSR Academy of Sciences Academician G. Marchuk.

[Question] Guriy Ivanovich, for the first time in the practice of the work of the Presidium of the academy its field meeting is taking place at such a distance from Moscow. To what is this attributable?

[Answer] Last summer General Secretary of the CPSU Central Committee Mikhail Sergeyevich Gorbachev visited the Far East. Having acquainted himself with the state of affairs in the region, he posed an important and specific task: to increase the economic potential of the land by the ocean and to expedite its social development. Of course, these most important transformations, and in such an enormous region as the Far East, are impossible without serious and comprehensive scientific support.

Therefore, the Presidium of the USSR Academy of Sciences decided not only to increase the attention to the Pacific Ocean region of our scientific forces which are located in the central regions of the country, but also to increase significantly the role and responsibility of Far Eastern science itself.

[Question] Will any organizational steps be taken to raise Far Eastern science to a higher level?

[Answer] At a recent meeting of the Presidium of the USSR Academy of Sciences it was deemed necessary to increase the organizing and guiding role of the scientific centers, which exist in the Far East and the Urals, and to transform them into departments of the academy. Following the establishment of the Far Eastern Department of the USSR Academy of Sciences we will leave

for Sverdlovsk, where we will form another one--the Ural Department of the academy.

Why are the new departments needed and what will they give us? In each union republic there are its own academies, but the RSFSR does not have it. The RSFSR is so enormous and its regions are so remote and different from each other that a network of large and significant scientific centers is extremely necessary on such a vast territory. Our eastern departments are, if you wish, regional academies of sciences, which not only work for the economy of the country, but first of all also help the krais and oblasts of their zone to develop more rapidly.

We will significantly broaden the powers of the departments and will turn over entirely to them many functions which were previously performed only by the staff of the Presidium of the USSR Academy of Sciences. Thus they will themselves formulate and approve the basic directions of basic research, organize and coordinate the work on complex intersectorial problems in the system of academic, VUZ, and sectorial science, specify their own personnel policy, and distribute among scientific institutions financial, material, and technical resources.

The departments will also bear full responsibility for the extent of the contribution in the corresponding fields of science on the scale of the entire country. It is necessary already in the immediate future to place biologically active substances at the service of man. Who but the people of the Far East, who, as they say, have both the vast expanses of the Pacific Ocean and immense tracts of taiga at hand, should first of all engage in the search for them, the study of the curative properties, and extensive commercial production?

We have come to the conclusion that the structure of our scientific research institutes needs improvement. Being developed extensively for a long time, these scientific institutions have become unwieldy and organizationally conservative, they react slowly to new directions and problems arising in science, and do not assist talented young people in completely revealing their potentials. We will vigorously reorganize these subdivisions and make the institutes more flexible and sensitive to the needs of the economy.

[Question] This concerns science of the Far East to a smaller degree, but all the same both in the central regions of the country and here for the present it is still very difficult for young and talented scientists to reach the commanding heights and to achieve the introduction of their own ideas in production....

[Answer] Yes, such a problem exists. Recently the Presidium asked itself the question: Who heads our academic institutes? It turned out that of the 250 directors there are 60 people from 65 to...91 years old. But here, too, it is not necessary to invent anything. Back in 1962 it was stipulated that people not over 65 can hold scientific organizational positions, but in practice this principal is adhered to far from always. Now we are studying thoroughly the age problem in the academic environment and are preparing our own proposals. Undoubtedly, it is necessary to support in every way and

promote young people, just as it is reasonable to combine their energy with the experience of mature scientists.

[Question] And a final question, Guriy Ivanovich, in what way will the establishment of the Far Eastern Department of the USSR Academy of Sciences affect the sociocultural development of the region?

[Answer] Unfortunately, the Far East for the present is not receiving the proper sociocultural support. The people of the Far East live under difficult both geographical and climatic conditions, they have the right to count on greater comfort in life. In practice we see the opposite. For example, the Far East does not have enough schools, hospitals, kindergartens, stadiums, and palaces of culture. This situation must be changed in a most immediate manner. And the contribution of Far Eastern science can be most significant in the accomplishment of these tasks. It is necessary to build here more rapidly, more soundly, and more reliably.

There are more and more complaints from the people of the Far East about environmental pollution--smoking boiler houses, the muddy water of seas and rivers. And here science should voice its resolute opinion and help enterprises to change over to ecologically clean modes.

The Far East has a unique, very interesting past. But the region for the present has been studied little by archeologists. Yet very important civilizations emerged here. The more thorough study of their interrelations is one of the tasks of Far Eastern historians and ethnographers.

We are convinced that the Far Eastern Department of the USSR Academy of Sciences will completely come up to our expectations.

7807

CSO: 1814/112

CONFERENCES AND EXPOSITIONS

ROLE OF WORKERS' CREATIVITY IN PRODUCTION INTENSIFICATION

Moscow NIR: PROBLEMY I RESHENIYA in Russian No 24, 16-31 Dec 86 p 2

[Article by Yu. Meshkov: "The Innovator and Progress"; first two paragraphs are NIR: PROBLEMY I RESHENIYA introduction]

[Text] "The role of the technical creativity of workers under the conditions of the intensification of social production and the means of stimulating the activity of the All-Union Society of Inventors and Efficiency Experts" was the theme of the All-Union Applied Science Conference which was held on 5-6 December in Moscow. Its organizers were the Central Committee of the All-Union Society of Inventors and Efficiency Experts, the State Committee for Inventions and Discoveries, and the Higher School of the Trade Union Movement of the All-Union Central Council of Trade Unions.

The 8th Plenum of the Central Committee of the All-Union Society of Inventors and Efficiency Experts, which was held a day earlier and at which the work on the acceleration of the introduction of inventions and efficiency proposals and the further development of the technical creativity of workers was examined, preceded the conference.

The All-Union Society of Inventors and Efficiency Experts is today about 115,000 primary organizations of the society, which unites more than 14 million inventors and efficiency experts. From 70,000 to 80,000 author's certificates for inventions are issued annually in the country, but only a third of this intellectual potential finds application in production. Such a situation cannot but cause alarm, does direct harm to the economy, and adversely affects the labor of inventors.

As was emphasized at the conference, in the past 10 years the mass character of the participation of workers in technical creativity has practically not increased. Is it not because the inventor too often is left in the literal sense one on one with his idea and does not receive the necessary support on the part of production, for the good of which, strictly speaking, he also worked?

Reorganization in the socioeconomic sphere and the renovation of the national economy on the basis of the achievements of scientific and technical progress are creating favorable conditions for the fruitful activity of inventors and

efficiency experts, but at the same time also require serious changes in the economic mechanism of the management of invention and the streamlining of the organizational forms of the activity of the All-Union Society of Inventors and Efficiency Experts.

Recommendations, which are aimed at the improvement of the planning and management of the creative activity of inventors and efficiency experts, the acceleration of the introduction of the results of their labor in practice, and the intensification of the promotion of the achievements of inventors and efficiency experts, were adopted in accordance with the results of the work of the applied science conference. In particular, the suggestion to revise the now prevailing statute on the conclusion of contracts between the administration of the enterprise and the inventor for the development and introduction of the technical innovations needed by production with allowance made for the requirements of the new USSR Law on Individual Labor Activity was addressed to the USSR State Committee for Labor and Social Problems and the State Committee for Inventions and Discoveries. It was recommended to the State Committee for Inventions and Discoveries with the participation of the Central Committee of the All-Union Society of Inventors and Efficiency Experts to develop a method of the selection and the evaluation of the significance of inventions. It was deemed necessary to ask the All-Union Central Council of Trade Unions and the USSR State Committee for Labor and Social Problems to adopt a decree, which permits organizations of the All-Union Society of Inventors and Efficiency Experts to establish temporary creative collectives made up of active inventors and efficiency experts for the development and implementation of inventions and efficiency proposals, which are aimed at the accomplishment of important social tasks, including the reduction of the proportion of manual labor and the renovation of operating works. The request to revise the now prevailing statute on the production brigade, having envisaged in it recommendations on the development of efficiency promotion among the members of the brigade and forms of moral and material incentives for the creative solution of production problems at the level of inventions and efficiency proposals, was also addressed to the All-Union Central Council of Trade Unions and the USSR State Committee for Labor and Social Problems.

The introduction everywhere of the state acceptance of products at industrial enterprises also found reflection in the recommendations of the conference. Thus, the Central Committee of the All-Union Society of Inventors and Efficiency Experts has to determine the participation of the councils of the society jointly with the services of State Extradepartmental Control in the work on the evaluation of product quality and the technical level of the items being developed and of the use of inventions in them.

7807

CSO: 1814/108

CONFERENCES AND EXPOSITIONS

ACADEMY PRESIDIUUM, COORDINATING COUNCIL MEET IN VLADIVOSTOK

Far East Development Trends

Moscow PRAVDA in Russian 18 Dec 86 p 2

[Article by PRAVDA correspondent N. Bratchikov under the rubric "The Horizons of Science" (Vladivostok): "By the Right of Discoverers"; first paragraph is PRAVDA introduction]

[Text] What is the Far East to be like? Will it be able to quickly turn into a large, balanced scientific production complex of the country? What is it necessary to do here and how? Science should give already today an answer to these and other problematic questions, which arose during the Far Eastern trip of General Secretary of the CPSU Central Committee M.S. Gorbachev. A field session of the Presidium of the USSR Academy of Sciences and the Council for the Coordination of the Scientific Activity of the Union Republics was held in Vladivostok. Party and economic personnel of Vladivostok, Khabarovsk, Blagoveshchensk, Yuzhno-Sakhalinsk, Petropavlovsk-Kamchatskiy, and Magadan, directors of scientific research institutes of the Far Eastern region, as well as representatives of various USSR ministries and departments and the RSFSR State Planning Committee were invited to participate in the discussion.

Far Eastern science reckons its chronicle not from 1970, when eight academic institutes were united organizationally into a unified scientific center, but, perhaps, from the times of the expeditions of the trail blazers of the Russian land, who laid the foundations of the knowledge of this distant and remarkable region along the Pacific Ocean. Since that time the rare animal and plant world, the chain of islands with rumbling volcanos, the Pacific Ocean ore zone, and the sea with the most abundant biological and mineral resources have constantly attracted scientists.

But the rapid development and assimilation of the region required nevertheless not expeditionary, short-term studies, but the establishment here of its own reliable scientific base. Its first shoots showed only in 1923, when the Far Eastern State University was organized.

Today in the Far Eastern Scientific Center there are seven scientific research institutes, which are scattered throughout the region. Now there are neither more nor less of them—23. And 50 permanent establishments, marine stations,

and preserves. There is its own scientific research fleet, which is furnished with modern scientific and navigational equipment. In all 9,500 people, of whom 2,400 are scientists, work at the Far Eastern Scientific Center. Among them are 2 academicians, 14 corresponding members, 114 doctors of sciences, and 1,100 candidates of sciences.

The center in a short 16-year period of activity has acquired its own nature: a large group of Vladivostok institutes in their basic research have headed for the ocean, the people of Khabarovsk have been elaborating a "continental" theme, the Baykal-Amur Railway Line, Kamchatka has formed a volcano center of world significance, while Blagoveshchensk has displayed an inclination for the land. Given such a distribution of forces the center has achieved rather good results, especially in the area of geology and geophysics.

However, as a whole the directions and level of research of the Far Eastern Scientific Center have still far from matched the acceleration, which the Far East achieved during the years of the 10th and 11th Five-Year Plans, and especially in case of its shift to the qualitatively new round in the development of local productive forces--the transformation of the Far Eastern Economic Region into an independent national economic complex with a developed social and production infrastructure. This has its explanations. Remaining with respect to the set of institutes an academic subdivision, which "merely" studies the earth, the direction of the physical mathematical and technical type--mathematics, mechanics, machine science, and instrument making--did not undergo development at the center, to which the CPSU Central Committee directed the attention of the Academy of Sciences in good time in a special decree on the Far Eastern Scientific Center in 1980. At that time a large number of important steps on the development and improvement of its scientific, material, and technical base were outlined.

Six years passed. The time is sufficient to evaluate what kind of change came after this at the Far Eastern Scientific Center. Did changes in scientific acceleration appear? Critically analyzing the "pluses" and "minuses" of its youngest subdivision, the field meeting of the Presidium of the USSR Academy of Sciences was forced to frankly admit: neither the academy nor party organs locally had treated the fulfillment of the tasks posed by the party with the proper responsibility and understanding. And the center instead of the proposed changes of direction for pronounced progress at times during this period wasted efforts, spinning its wheels. Why?

The basis of the development of science--the material and technical base--as before remained neglected. New institutes were built very slowly. Money was invested in vacant stone boxes. The main contractor, the Ministry of Construction in the Far East and Transbaykal Regions, assimilated only 30-50 percent of the released assets. While the facilities in Khabarovsk, Magadan, and Yuzhno-Sakhalinsk, which are far from the center--the computer center, laboratory buildings, libraries--were not established at all. But the construction of housing and sociocultural and personal service facilities proceeded with particular difficulty.

In addition to these "objective" reasons the slowdown in research appeared due to the lack of development and weakness of the very management staff of the

Presidium of the Far Eastern Scientific Center. The territorial remoteness and dispersion of scientific institutions complicated the system of day-to-day management. The center's lack of clear tactics and a clear position on the supervision of the activity of individual institutes also had an effect. The personnel "leap-frog," starting with the frequent change of chairmen of the Presidium of the Far Eastern Scientific Center, as well as several institute directors and ending with managers of the local level--laboratories and departments--at times interfered. While an entire chain of other "submerged reefs," of course, stretches from here: the problem orientation of the scientific institutions located in the regions was not specified for the Far Eastern Scientific Center, the interaction of institutes within the center was poorly accomplished, there was no proper coordination of academic, VUZ, and sectorial science.

Chief Scientific Secretary of the Presidium of the USSR Academy of Sciences Academician G. Skryabin correctly gave one of the diagnoses of the disease of the center:

"The greatest bottleneck at the Far Eastern Scientific Center is personnel...."

Strictly speaking, everyone at the field meeting emphasized this: the people of the Far East, the members of the Presidium of the USSR Academy of Sciences, and the guests from republics, who are comparing the state of affairs in their own subdivisions with the Far Eastern subdivisions.

Today two counterflows have crossed in the narrow "neck" of the flow of personnel. Whereas previously the influx of scientists to the Pacific Ocean Basin, who were attracted by the most interesting themes, real prospects, and the strengthening material base, predominated, now it has not simply faded away, but reversed: in 16 years, for example, 541 candidates of sciences came to the Far Eastern Scientific Center, while 630 left. In all 65 doctors of sciences have left the boundaries of the Far East. Annually 35 percent of the assigned young specialists go back.

What is the way out of the formed situation?

"We should immediately deal with the establishment of the necessary--not the minimum, as we previously planned, but namely the necessary--sociocultural and personal service situation for the Far Eastern scientist," President of the USSR Academy of Sciences Academician G. Marchuk emphasized. "And only from such an initial standpoint to examine henceforth the solution of all other problems!"

Indeed: the analysis made during the field meeting showed that scientists of the Far East among their category are provided with housing far worse than everyone in the country. Here the line for apartments is excessively long--2,500 families. There are not enough kindergartens and nurseries. There are no Pioneer camps, sports and health-improvement complexes, and hospitals. The questions of dining and personal service have not been settled at the institutes of the Far Eastern Scientific Center. Working conditions also seem no better. The provision of the Far Eastern Scientific Center with laboratory

space is two-thirds as great as, for example, at the Siberian Department of the Academy of Sciences. The average capital-labor ratio of the people of the Far East with respect to machines and equipment is nearly twofold worse.

The discussion analysis of the reorganization of Far Eastern science at the field meeting faced the Far Eastern Scientific Center with the need to proceed toward the goal by three means. Here is the first of them. The time has come to transform it into the Far Eastern Department of the Academy of Sciences. The new structure will enable the Presidium of the Far Eastern Department to deal not only steadily, but also in an interested manner with the improvement of the material and technical base as a whole. It will establish a system of the day-to-day self-management and administrative and economic independence of institutes and the facilities of pilot experimental works, which are located both in Vladivostok and in other Far Eastern centers.

The second means is to finally establish a worthy material and technical base of science. To draw up a draft of a plan of the capital construction of the future department of sciences to 2000, taking into account all the peculiarities of the region and the needs of Far Eastern science—the long-range development of the scientific research fleet, the provision of computer hardware and equipment for studies of the ocean, and the establishment of design and pilot works in conformity with the new scientific directions. Here, of course, the assistance of the USSR Council of Ministers and the USSR State Planning Committee is needed.

And the third thing. Without getting carried away with the establishment of new institutes, during the years of the 12th Five-Year Plan to perfect the existing and recently established ones. And to place the emphasis mainly on sociocultural and personal service facilities for the scientist, for the institutes will remain standing as cold, dead buildings and castles without inhabitants on the shore of the Pacific Ocean, if a creative person does not come to these shrines of science.

Today 9,500 staff members work at the Far Eastern Scientific Center. But given the departmental structure the number will double, rather, should double. But such a miracle will not happen without the efforts and sincere concern of both the Academy of Sciences and the Far Eastern Scientific Center about the talented unskilled laborer of the shop of science. The present practice of personnel "drift" has revealed that it is impossible to attach a scientist to the Pacific Ocean shores by a bare idea alone, and there is no reason, apparently, to rely on reinforcement from outside, on newly arrived people. Here the Far Eastern Scientific Center will have to change radically its personnel policy. To formulate a realistic program of local personnel supply, in which the secondary school should become the primary unit--the selection and training of capable children and the organization of physical mathematical schools, small academies attached to institutes, and special boarding schools for the most gifted students of the upper grades with subsequent training at the higher school with special allotment for the Far Eastern Department. The next stage is the establishment at higher educational institutions of all large Far Eastern cities of base chairs of institutes of the future Far Eastern Department and the extensive use for instruction of their own scientific base.

The highly skilled specialist is a reliable guarantee that Far Eastern science will be able to cope with the duties which are now being assigned to it.

Use of Ocean

Moscow EKONOMICHESKAYA GAZETA No 50, December 86 p 19

[Article by TASS correspondent V. Bratchikova for EKONOMICHESKAYA GAZETA (Vladivostok): "Increase the Potential of Science"]

[Text] A field meeting of the Presidium of the USSR Academy of Sciences and the Council for the Coordination of the Scientific Activity of the Academies of Sciences of the Union Republics was held in Vladivostok. Its participants—leading scientists of the country—specified the vital tasks of reorganization in the system of the USSR Academy of Sciences.

What should the contribution of science to the use of the resources of the ocean be? A TASS correspondent directed such a question to Academicians A. Aganbegyan and L. Brekhovskikh.

"The Far Eastern Scientific Center has a sufficient potential," A. Aganbegyan noted. "Here there are six institutes of the biological type, two institutes of economics, and seven economic departments. This is making it possible to approach in earnest studies of the problems of the ocean. Today the task of speeding up the development of productive forces in the region by 1.5-fold is arising."

In the study and comprehensive use of the resources of the ocean the main thing is the problem of protein and biologically active substances. The basic region for obtaining biological resources today is shifting to the shores of the Pacific Ocean, where there are greater opportunities for increasing the catch of fish, moreover, the most valuable kinds--salmon. Much depends on science: new methods of raising fish and processing it are needed. This is a practicable means of increasing the protein resources of the country.

"The return of the institutes, which are dealing with minerals of the ocean, can be very significant," L. Brekhovskikh continued the conversation. "Here there is a very interesting geological structure: a volcanic belt of faults with exposed resources of minerals stretches along the entire Maritime Region, starting at the Sea of Okhotsk."

Various sections of the Sea of Okhotsk are very promising for petroleum and gas. In the Pacific Ocean there are large deposits of ferromanganese nodules. It is necessary to learn to quickly recognize them and to develop methods of extraction.

Having concentrated attention on the problems of the intensification of science in the interests of the development of the unified national economic complex of the Far East, the scientists noted that the structure of the institutions of the Far Eastern Scientific Center does not correspond to the tasks of the rapid socioeconomic development of the region. The decision to

prepare proposals on the transformation of the Far Eastern Scientific Center into the Far Eastern Department of the USSR Academy of Sciences was made at the field meeting of the Presidium of the USSR Academy of Sciences and the Council for the Coordination of the Scientific Activity of the Academies of Sciences of the Union Republics. Such reorganization will increase the influence of science on the development of the productive forces of the region and will increase its potential.

7807

CSO: 1814/111

DEVELOPMENT, INTRODUCTION OF NEW GENERATIONS OF EQUIPMENT

Moscow NTR: PROBLEMY I RESHENIYA in Russian No 23, 2-15 Dec 86 p 2

[Article by A. Yezhova: "Comprehensive Planning of Scientific and Technical Progress"; first paragraph is NTR: PROBLEMY I RESHENIYA introduction]

[Text] On 18-19 November 1986 the Central Board of the Economic Science Society (the section "The Planning of the National Economy"), the Academy of the National Economy attached to the USSR Council of Ministers, and the USSR State Committee for Inventions and Discoveries held the All-Union Scientific Conference "The Improvement of the Planning of the Development and Introduction of New Generations of Equipment."

More than 1,000 people--workers of directive organs, the USSR State Planning Committee, the State Committee for Science and Technology, the State Committee for Inventions and Discoveries, other ministries and departments, the USSR Academy of Sciences, associations, and enterprises, staff members of scientific research institutes, higher educational institutions, and institutes for the improvement of skills, and students of the academy--participated in it.

Academician Secretary of the Economics Department of the Presidium of the USSR Academy of Sciences A.G. Aganbegyan, Chairman of the State Committee for Inventions and Discoveries I.S. Nayaskov, V.V. Simakov, chief of a department of the USSR State Planning Committee, Chairman of the Central Board of the Economic Science Society T.S. Khachaturov, and others spoke at the opening.

The need for the use of the comprehensive planning of development and the assimilation and dissemination of new generations of equipment; for the improvement of the planning of the introduction of discoveries, inventions, and innovations; for the planning of the complete automation of production on the basis of robotics and flexible machine systems and the introduction of new generations of resource-saving technologies; for the planning of the training, advanced training, and increase of the skills of personnel, who are capable of mastering equipment of new generations, is emphasized in the recommendations of the conference.

We report to the readers that among the specific recommendations, which were made by the sections, there are, in particular, proposals which were

previously published in our bulletin. These are the suggestion on the establishment for rank and file engineers of the Cherepanovkh Prize (No 13, 1986) and the suggestion on the establishment of temporary creative collectives made up of plant specialists for the solution of urban problems (No 18, 1986).

7807

CSO: 1814/111

KIEV CONFERENCE ON INTRODUCTION OF S&T ACHIEVEMENTS

Kiev EKONOMIKA SOVETSKOY UKRAINY in Russian No 10 Oct 86 pp 88-91

[Article by I. Sotulenko, scientific secretary of the Ukrainian Republic Board of the Economic Science Society, under the rubric "Information": "Urgent Economic Problems of the Introduction of the Achievements of Scientific and Technical Progress In Production"]

[Text] The All-Union Applied Science Conference "The Urgent Economic Problems of the Introduction of the Achievements of Scientific and Technical Progress in Production," which was organized by the Central and Ukrainian Republic Boards of the Economic Science Society jointly with the USSR State Committee for Science and Technology, the All-Union Council of Scientific and Technical Societies, the Scientific Council of the USSR Academy of Sciences for Economic Problems of the Scientific and Technical Revolution, the Academy of Social Sciences attached to the CPSU Central Committee, the State Planning Committee, and the Ukrainian SSR Academy of Sciences, was held in Kiev on 5-6 May 1986. More than 350 people, who represent leading scientific and design organizations of the country and organs of economic management, took part in the work of the conference.

Among them were responsible officials of the USSR State Planning Committee and the USSR State Committee for Science and Technology, the Ukrainian SSR State Planning Committee, and USSR and Ukrainian SSR ministries and departments and managers of production associations and enterprises. Chief of the Economic Department of the Ukrainian CP Central Committee D.G. Nedashkovskiy, Secretary of the Ukrainian Trade Unions Council M.A. Zapolskiy, and Chairman of the Republic Committee of the State Institution Worker's Union V.P. Kolomiyets took part in the work of the conference.

The theoretical and practical economic problems of accelerating the introduction of the achievements of scientific and technical progress in production were examined at the plenary meeting and section meetings.

Chairman of the Ukrainian Republic Board of the Economic Science Society G.V. Dzis, chairman of the organizing committee and deputy chairman of the Ukrainian SSR Council of Ministers, opened the conference. He noted the great scientific and practical importance of the holding of this conference, which is taking place immediately after the 27th CPSU Congress, which formulated the

general strategic policy of the party of accelerating the socioeconomic development of the country. In this connection the orientation of the conference toward the solution of urgent economic problems of the introduction of scientific and technical achievements in production is legitimate and timely. Economic science should play a more and more significant role in the formulation of sound recommendations on increasing the influence on the acceleration of scientific and technical progress.

Academician A.G. Aganbegyan, chairman of the Commission for the Study of Productive Forces and Natural Resources attached to the Presidium of the USSR Academy of Sciences, delivered the report "Economic Problems of the Introduction of Revolutionary Technologies" at the plenary meeting. He examined the theoretical and methodological problems of scientific and technical progress under the conditions of the scientific and technical revolution. Considerable attention in the report was devoted to the factors of the rapid progress of science and technology. A basic place in this process should be assigned to the introduction of not separate scientific and technical achievements, but their integral systems. Revolutionary technologies, which are based on advanced achievements of basic science, are called upon to play a critical role here. This will make it possible to achieve a radical change in the acceleration of the socioeconomic development of the country. The speaker dwelt in detail on the questions of the calculation of the integral indicator of resource supply, the measurement of the productivity of national labor under the conditions of the scientific and technical revolution, the indicators of the calculation of the national economic efficiency, the role and place of the human factor in the acceleration of scientific and technical progress, and others.

The report "The Socioeconomic Efficiency of Scientific and Technical Progress" of Academician T.S. Khachaturov, chairman of the Central Board of the Economic Science Society, was devoted to the problem of measuring the results of scientific and technical progress and the degree of its influence on the state of the economics of the national economy, as well as to those basic directions of the scientific and technical revolution, the use of which will make it possible to achieve a radical change in extensive development. Among such directions there were distinguished: the electronization of the national economy, the complete automation of production, the creation of computer-aided design systems, and the development of new construction materials. The increase of the shift coefficient of equipment and the acceleration of its replacement rate were grouped with the organizational measures of the efficiency of social production. Attention was devoted to the coverage of such a new direction of the scientific and technical revolution as biotechnology, which makes it possible to strive for the 100-percent use of raw materials and materials and to develop waste-free technologies.

Vice President of the Ukrainian SSR Academy of Sciences Academician I.I. Lukinov, director of the Institute of Economics of the Ukrainian SSR Academy of Sciences, in the report "The Increase of the Influence of the Economic Mechanism on the Acceleration of Scientific and Technical Progress" dwelt on those problems of the improvement of the economic mechanism, the solution of which will make it possible to speed up significantly the introduction of the results of scientific and technical progress in the national economy. The

necessity of creating the conditions for the organizational and economic unity of interdepartmental links and the integration of science, technology, and industry was emphasized. The policy of the 27th CPSU Congress of the utmost consolidation of democratic centralism and cost accounting relations, the changeover of socialist enterprises to full cost accounting, the economic independence and responsibility of each labor collective for management without a loss, and the assurance of self-financing--these are the urgent tasks which it is necessary to accomplish. Ways and means of solving the problems of improving the economic mechanism for the acceleration of scientific and technical progress were suggested in the report. The establishment of powerful scientific technical complexes with engineering centers is one of them. The speaker told about the experience of the Ukrainian SSR Academy of Sciences in the establishment of such subdivisions. The cost accounting principles of the performance of scientific research, planning and design, and experimental development, it was emphasized in the report, are one of the levers of the intensification of the economy. They create the real prerequisites for the more effective development of cooperative and integrated relations on the basis of the formation of joint funds.

Doctor of Economic Sciences Professor V.G. Lebedev, head of a chair of the Academy of Social Sciences attached to the CPSU Central Committee, at the plenary meeting delivered the report "The Revolutionary Form of Scientific and Technical Progress and the Strategy of Its Efficiency." The content of the revolutionary forms of scientific and technical progress as the process of the development and introduction of innovations was specified in the report. Their essence consists in the use of a greater and greater amount of universal, as well as creative living labor. Information of a revolutionary content in the form of a description of new phenomena, the discovery of new laws and regularities, and the development of new theories should be the product of this labor. The speaker proposed to introduce the category the socioeconomic potential of the scientific and technical revolution as the aggregate success rate of the achievements being used with allowance for the expenditures. The idea of the necessity of the carrying out of the certification of all workers of the staffs of the management of the economy and the comprehensive discussion of the 20-year program of scientific and technical progress was expressed.

Academician of the Ukrainian SSR Academy of Sciences N.G. Chumachenko, director of the Institute of Industrial Economics of the Ukrainian SSR Academy of Sciences, in the report "The Organizational and Economic Problems of the Improvement of the Mechanism of Introducing Scientific and Technical Achievements in Production" stated the tasks which face economic science and economic practice in the creation of conditions, which are conducive to the acceleration of the introduction of the achievements of science and technology in production. Along with the interdepartmental scientific production complexes and engineering centers, which are being established, the advisability of using such organizational forms of scientific production cooperation as the creative contracts of the Ukrainian SSR Academy of Sciences with oblasts, joint operations of the Ukrainian SSR Academy of Sciences with ministries and departments, the establishment of centers for the introduction of means of the mechanization of manual labor (the experience of the Poltava

Oblast Council of Trade Unions), and others was indicated. Further the speaker dwelt in detail on the shortcomings in the practice of planning, which are checking the process of introducing scientific and technical achievements in production. The coordination of the results of scientific and technical progress with the other indicators of the activity of associations and enterprises is necessary for their elimination. In the report attention was devoted to the improvement of invention and efficiency promotion in the country. This is an important reserve of the influx of the latest achievements and discoveries into production.

Doctor of Economic Sciences Professor K.I. Taksir, deputy chairman of the Scientific Council of the USSR Academy of Sciences for Economic Problems of the Scientific and Technical Revolution, in the report "New Forms of the Integration of Science and Production as the Most Important Factor of the Development of Productive Forces" covered the most effective means of accelerating scientific and technical progress. Particular attention in the report was devoted to the extensive dissemination of organizational forms of the direct contact of science with production--scientific production associations. The obvious advantages, which are obtainable from such integration, were shown. Several unsolved problems were also revealed. Attention was directed to the fact that our economic mechanism for the present is oriented toward the retention of the achieved level of the technical equipment of production and the output of products which have been adjusted in production. The speaker voiced specific proposals meant for directive organs on the improvement of the mechanism of the integration of basic and applied science with production. Statewide steps on planning and regulation when using highly efficient inventions and efficiency proposals were suggested.

At the plenary meeting Doctor of Economic Sciences Professor N.A. Klimov, chief of a sector of the Institute of World Economics and International Relations of the USSR Academy of Sciences, delivered the report "The Stimulation of Innovations in the Capitalist Countries." The speaker covered the situation which is forming in the developed capitalist countries in the middle of the 1980's--recovery from the latest recession. The new upswing in the economy of these countries yielded a significant increase in labor productivity. The system of the introduction of innovations, which is inherent in the United States, Japan, and the countries of Europe, was described in the report. The need for the thorough study of this experience and its use, in an acceptable form, in the socialist countries was indicated. These are the combining of interstate efforts on basic and applied research of various directions of science; systems of the training of personnel, who have been adapted to the conditions of the scientific and technical revolution; the concentration of efforts in revolutionary directions of the development of science and technology. The speaker singled out the basic traits of modern capitalism in matters of innovations--these are, first, the sharp increase of the role of the state in the stimulation of innovations; second, the strengthening of intereconomic relations in matters of the introduction of the achievements of the scientific and technical revolution (between firms and banks, big and small business, and others); third, interstate contacts in matters of introduction activity.

In the report "The Experience of Increasing the Technical Level of Products," which V.A. Khomyak, deputy general director for economics of the Tochelektropribor Production Association, delivered, the tasks, which face economic scholars and managers in the acceleration of scientific and technical progress, were shown on the basis of the specific example of the enterprise. Suggestions, the implementation of which will make it possible to increase sharply the interest of enterprises in the introduction of scientific and technical achievements, were made. Among them are: the need for the improvement of the remuneration of the labor of designers and process engineers (with their regular certification); the change of the system of the pricing of new products; the improvement of the process of approving documents for the output of new models of equipment; the simplification of the procedure of coordinating documents, and others. Given just the accomplishment of these and a number of other urgent tasks it is possible to expect the real acceleration of the development and introduction in production of new equipment.

Academician of the Ukrainian SSR Academy of Sciences S.M. Yampolskiy, chief of a department of the Institute of Economics of the Ukrainian SSR Academy of Sciences, in the report "Economic Problems of the Acceleration of the Development of New Equipment Under the Conditions of the Intensification of Social Production" dwelt in detail on the theoretical aspects of scientific and technical progress and the scientific and technical revolution. Under socialism scientific and technical progress is the process of the continuous accumulation and improvement of knowledge and its use in new tools and objects of labor. Particular attention in the report was directed to the correlation of the economic mechanism and the system of the management of scientific and technical progress. The necessity of considering the needs of clients when producing new products was emphasized. In this connection it is necessary to direct attention to the gradual development of the necessary stocks of goods and reserve capacities for the possible reorganization of the production and technological processes. The principle of cost accounting as applied to the development and assimilation of new equipment and technology was covered thoroughly. Directions of the broadening of cost accounting and the changeover to self-supporting production [samookupayemost] were proposed.

Ye.I. Onishchenko, deputy chairman of the Kiev City Soviet Executive Committee and chairman of the City Board of the Economic Science Society, in the report "On the Experience of the Planning and Management of Scientific and Technical Progress in the Region" set forth the principles of the territorial planning of the development and introduction of the achievements of science and technology in production. The advanced know-how in matters of the acceleration of scientific and technical progress, which is being used at enterprises and organizations of Kiev, was shown. The significant scientific, technical, and production potential of the city predetermined the development and extension of the contact of science with production. These contacts are constantly being improved and extended. Enterprises and institutes have changed over from individual contracts on cooperation to a system of contracts. Such contacts of science with production as engineering centers and interdepartmental scientific technical complexes have confidently entered practice. Suggestions aimed at the improvement of the economic mechanism--a set of measures on the decrease of the materials intensiveness of products and

on the increase of the proportion of products of the highest quality category--were made. The drafting of a consolidated plan (by territory) of the development of science and technology was proposed as a tool.

S.I. Doroguntsov, chairman of the Council for the Study of Productive Forces of the Ukrainian SSR of the Ukrainian SSR Academy of Sciences, delivered the report "The Comprehensive Program of Scientific and Technical Progress in the System of the Management of Socioeconomic Development." In the report the need for long-range comprehensive programs of scientific and technical progress was substantiated and the impact from their formulation was shown, the experience of the Ukraine in the formulation of such a program for the period to 2010 was covered. Suggestions on the improvement of the mechanism of the implementation of the comprehensive program of scientific and technical progress were made. The orientation toward the highest world level with respect to all positions of the development of science, technology, and production should become the basic practical principle, which should find embodiment in the program.

With this the plenary meeting of the conference concluded its work.

It is planned to publish the reports of the plenary meeting of the conference and the basic reports, which were given in the sections, as a separate collection.

Five sections: "The Theoretical Aspects of the Acceleration of the Development of Science and Technology and the Intensification of Social Production," "The Improvement of the Mechanism of the Planning of Scientific and Technical Progress," "The Socioeconomic Efficiency of Scientific and Technical Progress," "The Organizational and Economic Problems of the Acceleration of the Development and Assimilation of New Equipment," and "The Improvement of the Mechanism of the Management of the Introduction of Scientific and Technical Achievements," at which more than 100 people delivered papers and reports, worked at the conference.(1) Recommendations were discussed and adopted. They specified the tasks of economic science and economic practice on the further improvement of the economic mechanism, which is aimed at the speeding up of the use of the achievements of scientific and technical progress and the intensification of the national economy as vital tasks which were posed by the 27th CPSU Congress.

FOOTNOTE

1. See the published heads of the reports: "Aktualnyye ekonomicheskiye problemy vnedreniya dostizheniy nauchno-tekhnicheskogo progressa v proizvodstvo" [Urgent Economic Problems of the Introduction of the Achievements of Scientific and Technical Progress in Production], Vol I-V, Kiev, 1986.

COPYRIGHT: Izdatelstvo "Radyanska Ukrayina", "Ekonomika Sovetskoy Ukrainy", 1986

7807

CSO: 1814/115

AWARDS AND PRIZES

VANAG PRIZE OF LATVIAN ACADEMY AWARDED TO E.YA. LUKEVITS

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR in Russian No 6, Jun 86 p 127

[Article by G. Zelchan under the rubric "Prizes of the Latvian SSR Academy of Sciences": "The G. Vanag Prize to E.Ya. Lukevits"]

[Text] In 1985 the Gustav Vanag Prize of the Latvian SSR Academy of Sciences was awarded to Corresponding Member of the Latvian SSR Academy of Sciences, Doctor of Chemical Sciences, and Professor E.Ya. Lukevits for the series of studies "Organosilicon and Organogermanic Derivatives of Furan and Thiophene," which were done during the period of 1975-1985.

E.Ya. Lukevits is one of the numerous students of G. Vanag, in whom the professor by his fascinating lectures throughout life instilled a love for science and organic chemistry. However, the student went farther than the teacher and selected as the field of his research not traditional organic chemistry, but a new field of chemistry--elementoorganic chemistry--which began to develop rapidly in the postwar years. E.Ya. Lukevits was the first in the republic to begin research on organosilicon compounds. The gaining of experience and the broadening of his outlook enriched the sphere of scientific research of E.Ya. Lukevits: he also studied the elements adjacent to silicon in group IV of Mendeleyev's Periodic System--germanium, tin, and lead.

The systematic research in the field of silicon- and germanium-derivatives of thiophene and furan--heterocycles with an aromatic nature--which had not been studied at all prior to this, is summarized in the work which was awarded the prize. Even earlier many researchers noted that silicon-derivatives of benzene and other aromatic compounds in their properties differ from the corresponding carbon analogs significantly more than was possible expect from the simple replacement of an atom of carbon with the heavier and more voluminous atom of silicon. The establishment of the actual cause of this difference on the basis of examples of compounds of silicon and its closest analog--germanium--with furan and thiophene, in which the aromatic effects appear most vividly, was one of the tasks of the study of E.Ya. Lukevits.

The theory of the structure of atoms allows the possibility of the existence in silicon and germanium of d-orbitals of electrons, which are not filled with electrons. The scientific disputes about the reality of these orbitals and their possible influence on the electron and chemical properties of compounds

of silicon and germanium. The research undertaken by E.Ya. Lukevits should also have cast light on this problem, since the hypothesis that precisely d-orbitals might be responsible for the strange, at first glance, properties of compounds of silicon and germanium existed.

Numerous series of previously unknown furyl- and thienyl-derivatives of silicon and germanium with the selection of other organic groups from atoms of these elements, which ensure the gradual change of the electron properties from compound to compound, were synthesized for the solution of the problem. The synthesized series of compounds were carefully studied by means of infrared, ultraviolet, photoelectronic, and mass spectroscopy, nuclear magnetic resonance spectroscopy on nuclei of ^1H , ^{13}C , ^{17}O , and ^{29}Si was used especially extensively.

The analysis of the spectroscopic data made it possible to come to very interesting conclusions. It turned out that the bonds of silicon and germanium with carbon aromatic systems of furan and thiophene are of a dual nature and have an increased multiplicity. In accordance with the usual single, or σ -bond the displacement of electrons, or the induction effect, is directed from the metal (Si, Ge) to the aromatic radical, while the π -electrons of the aromatic system interact, in turn, with the unfilled d-orbitals of the metal in the reverse direction, creating the so-called $p_{\pi}-d_{\pi}$ -effect and an additional bond. This phenomenon is also the basis for the previously incomprehensible peculiarities of compounds of silicon and germanium with aromatic systems.

The correctness of the conclusions was confirmed during the study of various chemical reactions of synthesized compounds of silicon and germanium. The direction of the reactions and the relative speed accorded well with the expected ones, if you consider the interaction of the d-orbitals with the aromatic system.

Substances with interesting biological properties, which show the promise of the further search for new drugs among compounds of silicon and germanium, were also discovered among the synthesized compounds.

Thus, the study made by E.Ya. Lukevits and associates makes a substantial contribution both to elementoorganic chemistry and to the theory of the valency of chemical compounds.

COPYRIGHT: Izdatelstvo "Zinatne", "Izvestiya Akademii nauk Latvyskoy SSR", 1986

7807

CSO: 1814/113

GENERAL

PROBLEMS OF SCIENTIFIC, TECHNICAL PROGRESS IN CONSTRUCTION

Moscow STROITELNAYA GAZETA in Russian 19 Dec 86 p 1

[Article: "Science for Production"]

[Text] Recently at one representative conference they asked the director of a scientific research institute: "What do you think--why is the decision to close your institute ripening?" The executive could not answer. He could not, first of all, cite convincing arguments which would confirm the great efficiency of the work of the large scientific subdivision and its appreciable influence on the matters in the sector. To what does this testify? Without a doubt, to the great isolation of a number of scientific research collectives from practice, to their penchant for minor themes, and to the atmosphere of equitability and complacency, which has already become customary.

The 27th CPSU Congress set for the workers of our sector truly enormous and difficult tasks: to shorten to at least one-half the period of the construction and renovation of facilities, to place them into operation in the standard time, so that the advanced technical solutions, which were used in the designs, would not become obsolete. And in the end, to build projects which surpass in their technical and economic indicators the best world analogs. Many technical and production problems have to be solved in the course of the reorganization of the sector. In this process of the transformation of productive forces and production relations sectorial science is called upon to play an important role. Thoroughly substantiated recommendations and large-scale developments are expected from it.

But why, one would like to know, is it necessary to wait for them, if scientific research institutes are obliged to do all this in good time? It is possible to find the answer in the analysis of the activity, for example, of the Scientific Research Institute of Construction Physics. Its staff members dealt mainly with theoretical and special questions, while the major problems, which are connected with the sharp increase of the quality of the buildings and structures being erected, remained outside their field of view.

The collectives of the Northern Scientific Research Institute of Hydraulic Engineering, the Scientific Research Institute of Keramzit, the Central Scientific Research and Planning Institute of Standard and Experimental Planning of Housing, the Central Scientific Research and Planning Institute of

Standard and Experimental Planning of Engineering Equipment, and a number of other scientific and scientific planning institutes have a poor creative return. The basic reason is the same--the creative efforts are being concentrated on developments which do not yield an appreciable impact in production.

Special responsibility for the comprehensive solution of the key problems of the sector has been assigned to the main scientific research institutes. But, unfortunately, many of them are not coping with this leading role of theirs. Thus, the State Scientific Research Institute of the Cement Industry for a long time has not been setting the tone in the technical policy of the cement industry and has not been submitting well-founded proposals on the improvement of resource-saving technologies, including on the production of cement by the dry method, as well as a finely ground complex binder. The main institute did not fulfill during the 11th Five-Year Plan a fourth of the assignments on scientific and technical programs. The work on the development and assimilation of the production of high-strength, self-stressing, and high-early-strength cements was especially drawn out--attention was repeatedly directed to this in the pages of STROITELNAYA GAZETA.

Practice is making a special claim on the Scientific Research Institute of Construction Economics, which is not providing thoroughly substantiated answers to many fundamental questions. The efforts of the collective of this institute are not concentrated on the main tasks of increasing the efficiency of the work of the sector, such as the improvement of the organizational structure of the forms and the system of management (including construction planning and industrial planning associations), the development of the collective contract, the stimulation of labor, and others. This organization does not have close creative contact with the institutes of the USSR Academy of Sciences and the USSR Ministry of Higher and Secondary Specialized Education, at which large scientific forces are concentrated. Now economic science has to catch up with production and adjust itself to the pace of the reorganization of the large sectorial economy. It is impossible to tolerate further such an irresponsible attitude toward the matter in the most important section of capital construction.

In order to achieve the planned acceleration of scientific and technical progress, which is the main reserve of the increase of labor productivity, it is necessary to resolutely and radically change and improve the methods and forms of the organization of research, striving for the shortening of the cycle "from the idea to introduction." Life makes it incumbent to solve the problems not only more quickly, but also comprehensively. Under such conditions scientific production associations, scientific and technical centers, and special interdepartmental temporary collectives of scientists are most flexible and efficient. Formations of this sort have already appeared. The Stroyfosfat Interbranch Engineering Center has been established on the basis of the Central Scientific Research Institute of Structural Components imeni V.A. Kucherenko of the USSR State Committee for Construction Affairs. Five scientific and production organizations of the Ministry of the Chemical Industry and the Ministry of Mineral Fertilizer Production belong to it. Its task is to develop and organize on the basis of phosphate binders, which are inorganic polymers, materials for various purposes with preset properties.

At present 14 interdepartmental collectives and engineering centers for the development and introduction of new equipment and technologies based on scientific research institutes of the USSR State Committee for Construction Affairs are being organized. Similar organizations are also being formed in other departments. It is important, of course, that the process of transforming the structure of sectorial science in conformity with the requirements of today has been started. At several institutes the aspiration to go in well-trodden thematic directions, which are aimed at narrow specialized research, became noticeable already after the first steps. Given such an approach the falling into minor themes and the dispersal of creative forces are not eliminated.

For example, considerable forces and assets are being spent on the mechanization and automation of plastering processes at construction projects. Of course, it is necessary to decrease the labor intensiveness of operations. But it is important to see to it that the amount of wet plaster work at the sites would be reduced, having expanded the scale of use of industrial components with a high level of plant readiness.

Of course, before establishing scientific and technical centers, one should clearly determine the direction of their activity and their possible real contribution to the increase of the efficiency of labor and production. They are called upon to solve cardinal problems of the intensive development of the sector. The responsibility for the improvement of the network and structure of scientific research institutes has been assigned to the Main Scientific and Technical Administration, which has been newly established in the USSR State Committee for Construction Affairs, and to ministries and departments of the construction complex.

Science should do much in the direction of the acceleration of scientific and technical progress. Opportunities exist for this. In all 45 scientific research and 73 complex scientific planning institutes with a total of 42,000 workers belong to the construction complex. Moreover, a significant portion of the scientific forces is concentrated at educational and academic institutions. The duty of ministries and departments is to aim the efforts of all sectorial science first of all toward the solution of the basic problems of capital construction and to create all the necessary conditions for the maximum return of scientific research institutes and collectives of researchers and designers. The duty of every scientist is to work resourcefully, creatively, and with complete dedication. Such is the command of the times, such is the discipline of reorganization.

7807

CSO: 1814/110

- END -

END OF

FICHE

DATE FILMED

August 28, 1987

D.S.